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GENERAL SCIENCE

THREE DAY LOAN

THE AGRICULTURAL GAZETTE OF CANADA

CORN GROWING.

ELEMENTARY AGRICULTURAL INSTRUCTION.

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DEPARTMENT OF AGRICULTURE
OTTAWA, CANADA

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VOL. 2, No. 2 February, 1915

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette
of Canada

EDITOR: J. B. SPENCER, B.S.A.

Issued by direction of
THE HONOURABLE MARTIN BURRELL
Minister of Agriculture

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The Agricultural Gazette
OF CANADA

VOL. II FEBRUARY, 1915 No. 2

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CORN.

CORN is one of the staple crops of the world. As food for man it occupies an important position and for farm animals it stands at the head of all crops in quantity and value of grain and fodder. In weight of grain corn is surpassed only by wheat in the world's production of cereals. When reckoned in bushels it stands next to oats in harvest returns. In those countries adapted to its production it is more extensively grown than any other grain and climatic conditions alone limit its more widespread cultivation. The total world's crop of corn exceeds three and one-half billion bushels. Of this stupendous quantity the United States grows more than seventy-five per cent where the total production is about four times that of wheat. The following figures show the comparative world's crops by weight and by bushels of leading cereals for the average of the five year period—1908-1912:—

	Tons of 2,000 lb.	Bushels.
Wheat	104,339,000	3,477,995,000
Corn	103,248,000	3,687,463,000
Oats	66,871,000	3,933,673,000
Rye	47,057,000	1,680,629,000
Barley	33,857,000	1,410,731,000

In Canadian agriculture corn has filled an important place from the beginning. The Indians and early settlers found it useful as a means of sustenance. Early writers say that the Indians girdled the trees to destroy their leaves and let in the sunshine, scratched the ground, dropped in the seed and secured a crop. The white man found it of the utmost value before the soil could be cleared and cultivated for wheat and rye.

By the aid of science great progress has been made in extending and improving the corn crop in Canada. Thirty-three years ago, 1881, the corn crop of the Dominion was recorded to be 9,025,142 bushels, whereas in 1913 it was 16,772,600 bushels. In 1893 the yield of fodder corn was 1,049,524 tons and in 1913, 2,616,300 tons, to say nothing of the improvement that has been made in the quality of the crop. In this improvement almost every province has been active. What has been done is fully stated in this number of THE AGRICULTURAL GAZETTE.

THE STANDARDIZING OF PUBLICATIONS.

THE suggestion made in the January number of THE AGRICULTURAL GAZETTE, for the standardizing of publications issued by Departments of Agriculture, has met with fairly general approval.

No sooner had it come to the attention of Prof. M. Cumming, Secretary for Agriculture for Nova Scotia, than action was taken in the desired direction. Having the manuscript for a bulletin ready for the printers, Prof. Cumming ordered it to be made the same size as the bulletins of the Dominion Department of Agriculture, which is also the size of THE AGRICULTURAL GAZETTE OF CANADA.

Mr. William McIntosh, Curator of the Natural History Society of New Brunswick, at the request of the Acting Secretary for Agriculture, has gone carefully into the question, and decides that the difference in the size of agricultural bulletins issued throughout Canada is not great, and that uniformity may be obtained by cutting to a standard size, without altering, to any extent, the size of the printed portions.

Excepting the British Columbia report, which is larger than any of the other publications, they fall into two groups. Publications of Group 1, which include all, except bulletins of Manitoba, New Brunswick, Nova Scotia and Quebec, have a maximum length of 10 inches, a minimum length of 9 3/8 inches, a maximum width of 6¾ inches and a minimum width of 6 7/16 inches, which is only ⅝ of an inch difference in length and ⅜ of an inch difference in width. Most of them have a printed area of 4 x 7 to 5 x 8 inches, leaving ample room for trimming to a volume 6½ x 9¾ inches. The Dominion and Ontario reports and bulletins and the Quebec reports all come within 1/16 of an inch of this size.

Publications of Group 2 have a maximum length of 9 and a minimum length of 8½ inches; a maximum width of 5 15/16 and a minimum width of 5¾ inches, being a difference of ½ of an inch in length and 3/16 of an inch in width.

Mr. Roadhouse, Deputy Minister of Agriculture for Ontario, suggests the present size of the reports and bulletins issued by the Ontario Department of Agriculture.

Mr. Moorhouse, Assistant Deputy Minister of Agriculture for Manitoba, states that the present size of their publications is in every way satisfactory.

Mr. Mantle, Deputy Minister of Agriculture for Saskatchewan, observes that if Nova Scotia would lengthen its bulletins and British Columbia shorten theirs, the question would be largely solved. He states that the bulletins and reports issued by their province are standardized by the government printer with those of other departments of the service.

Mr. Geo. Harcourt, Deputy Minister of Agriculture for Alberta, writes as follows: "I have consulted the various heads of the branches of this Department and the general opinion appears to be in favour of either the size of our own bulletins, which is intended to be 6½ by 10, or that of THE AGRICULTURAL GAZETTE, 6½ by 9¾.

Mr. Scott, Deputy Minister of Agriculture for Victoria, considers that it would be difficult to bring about a standard, and cannot see that any very useful purpose would be served thereby.

THE AGRICULTURAL GAZETTE recommends for consideration the points brought out by Mr. McIntosh of New Brunswick.

PART I.

Dominion Department of Agriculture.

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS BRANCHES REPRESENTED.

THE DOMINION EXPERIMENTAL FARMS.

THE DIVISION OF AGROSTOLOGY.

INDIAN CORN FOR ENSILAGE.

BY M. O. MALTE, PH.D., DOMINION AGROSTOLOGIST.

IN Canada, the problem of growing Indian Corn profitably for ensilage has, during the past years, attracted considerable attention perhaps chiefly because its success has so often been disputed. It has been claimed that Canada is situated too far north and that, consequently, corn, being a southern plant, could be of no universal importance in the Dominion. On the other hand the most enthusiastic advocaters of corn growing have brought forward seemingly convincing evidence, to the effect that the successful growing of corn for ensilage, must necessarily be the very foundation upon which should rest the prosperity of the dairy farmer, and even the future fame of Canada as a mixed farming country.

The truth lies in the middle, as is generally the case. That is to say there are districts in Canada, where Indian corn could and should be grown to the greatest advantage, but on the other hand there are thousands of square miles where the profitable growing of Indian corn, would prove very difficult at present, if not impossible.

Remember, that the climate and the length of the growing season militates against successful corn-raising in many parts of Canada. To make the same a success, human knowledge must battle against the very nature of the corn plant, analyze it, and as a result thereof, forcibly develop those forms and varieties, which in spite of hardships, are able through their specific yielding capacity to meet not only the humblest expectations of the farmer, but also to make his investment a paying proposition.

To prove to the farmers, the relative value of different corn varieties, in different provinces and districts thereof, has been for scores of years the object of the vast multitude of experiments carried out by the Experimental Farms' system. Although, of course, these experiments are far from being finished it can safely be stated, that most valuable results have been gained.

Thus, the experiments have proven that the quantity of ensilage raised per acre should under all circumstances be viewed in the light of its quality. That is to say, that the quality of the ensilage produced by a certain variety of corn should be the factor which should guide the farmer in his choice of the variety. Many varieties may give a superior yield fascinating to the casual observer, but nevertheless prove inferior for ensilage purposes to others which are capable of producing only a comparatively scant yield. The reason for this is, that the feeding and milk-producing value of the corn ensilage depends upon the degree of maturity of the corn. A variety which produces stalk and leaves during the growing season, but fails to bring its cobs to a sufficient degree of maturity, will furnish a comparatively poor material for ensilage. The ensilage will be acid, deficient in nutritive constituents and on the whole prove a rather expensive feed, when viewed from a practical, dollar and cent standpoint. On the other hand a variety which is capable of reaching the stage of maturity in which the feeding value is the very highest, that is to say the "glazed" stage, may in reality prove superior in spite of the fact that its yield, as far as tonnage is concerned may seem to indicate the contrary.

Briefly, the experience gained by the Experimental Farms demonstrates the wisdom of increasing the acreage of early varieties rather than of depending on large yielding late sorts for the desired tonnage.

THE DIVISION OF HORTICULTURE.

THE PROPAGATION OF ORNAMENTAL PLANTS SUITABLE FOR SCHOOL SURROUNDINGS.

BY F. E. BUCK, B.S.A., ASSISTANT IN ORNAMENTAL GARDENING.

THE aim of the teacher is to make the country school a centre of useful influences, at least that is an aim which the rural school teacher each year finds more possible of realization. The school as an educational centre, a social and recreational centre, and a centre from which there shall spread the longing to have really creditable and beautiful rural homes, is not at all a visionary idea and is perhaps realizable for every rural school in the land.

The seed of this idea is already germinating and the resulting plant is bound to yield much valuable fruit to nourish the physical, social, and spiritual life of the nation.

In offering a suggestion with regard to the function which the rural school may fulfil, in connection with the delightful task of disseminating a greater love of the beautiful among its pupils and their parents, it is only natural to recall the handicaps which envelop some rural schools. Lack of any appreciation, on the part of parents and trustees, of the material and ethical value of beauty, lack of room around the school house, or a very shabby looking building, lack of funds and what not. But such things to the teacher with vision need not totally discourage. With every idea a beginning must be made, and where a beginning has been made already so much the better.

The subject of this paper "Propagation of Ornamental Plants," in many of its aspects is not new to the teacher, although it may be new to many of the children. Whether it is so or not, it may be used as the basis for either starting or helping forward the work of creating more rural beauty, with the school as the centre of the movement.

The first thing to reflect on is how to start such work in a practicable, simple way and with some hope of success, especially if the task of obtaining funds for such work is difficult. The best advice that can be given on this point is to say that, if the school grounds have received that preliminary attention in the matter of grading and levelling, etc., and if funds are procurable for the purpose, it will be wise to purchase a few hardy shrubs and ornamental trees from a reliable nursery company and plant them out at once. But supposing this is accomplished already and that the school grounds are laid out to play-ground, school gardens, etc., or, supposing the school grounds in any condition you please, there is still a great opportunity for the rural school to become a strong influence in disseminating true beauty and fragrance throughout many rural communities, and this by means of a thoroughly workable and simple plan. More than twenty-five years ago the Central Farm at Ottawa began the work of testing ornamental plants to obtain suitable varieties for the different conditions of our Canadian climate. There soon followed the work of distributing these plants to Branch Farms in different parts of the country. The results to-day are that there are numbers of beautiful grounds, driveways, parks, public institutions, etc., which owe their beauty to plants thus disseminated; many were raised from seed, cuttings, etc., at the Central Farm, Ottawa. What the Central Farm has been to the Dominion at large, the rural school may become to the community it serves.

THE METHOD.

The suggestion is then, that it would be a practicable and quite simple scheme for the teacher of each rural school to start a small school nursery. This nursery might consist of a twelve foot strip, or less, at one end of the school grounds. It must be prepared to receive the plants which may be raised from seed and cuttings in a still smaller seed bed. The seed bed then is the first thing to be started. And what shall be started in it? Only the seed of those plants which are hardy, beautiful, and suitable—suitable for two purposes: First, to plant around the school grounds in those positions where trees, hedges, shrubs and flowers will help to beautify the school house and grounds, and secondly, to distribute amongst the pupils so that they may take home a few shrubs such as lilac, honeysuckle, Japanese rose, etc., to plant around their own homes.

PREPARATION OF THE SEED BED.

The preparation of a suitable seed bed in which the seeds of shrubs and perennial flowers may be sown will involve about a day's careful work, not more. The beds as prepared at Ottawa for this purpose are very simple affairs. The beds are made four feet wide and any length, six-inch boards are used and these are kept in position by stakes driven into the ground every few feet to which the boards are nailed. Inside the area enclosed by the boards the soil is thoroughly prepared, all coarse stones, weeds, etc., are taken out and finally, as a top-dressing, a layer of several inches of good quality, fine sandy loam is applied. This is in order that the seeds may have every chance to germinate properly. The only other thing that is necessary is something with which to shade the young plants as they are coming up. For this purpose any sort of coarse canvas may be nailed to a frame and used, or laths nailed together to form a lattice, form equally useful shading material. In fact many methods of shading may be used with equal success.

SOWING THE SEED.

In sowing the seed little trenches are made crossways of the bed. That is, the rows are each four feet long, and these trenches, which are made by placing a four foot board on its edge and pressing it firmly into the soil, are made about six inches apart and one or two inches deep according to the size of the seed to be sown. Covering the seed is a simple matter, and may be done with the fingers or with the board which was used for making the trench. The soil should be slightly firmed after the seed has been sown, and if at all dry it must be thoroughly watered. By sowing the seed early in the spring, when it is best to sow it, the work of watering this seed bed will be very light, as the spring rains are generally sufficient to start the seed into growth. Later on in the summer when the sun is hot, water should be given every day, and the shade mentioned in the foregoing, should be used during the hottest days.

BOX ELDER (MANITOBA MAPLE) SEEDLINGS AT THE EXPERIMENTAL STATION, SCOTT, SASK.

Seed Sown May 25th, Photo Taken August 20th.

In the Prairie Provinces where the summers are hot and dry, it is best to sow the seed in the autumn just before the ground freezes up. It is best to use, where possible, seed gathered during the same summer. Seed from trees like the Ash and Manitoba Maple is very easily collected. These trees are particularly useful on the Prairies and do well there.

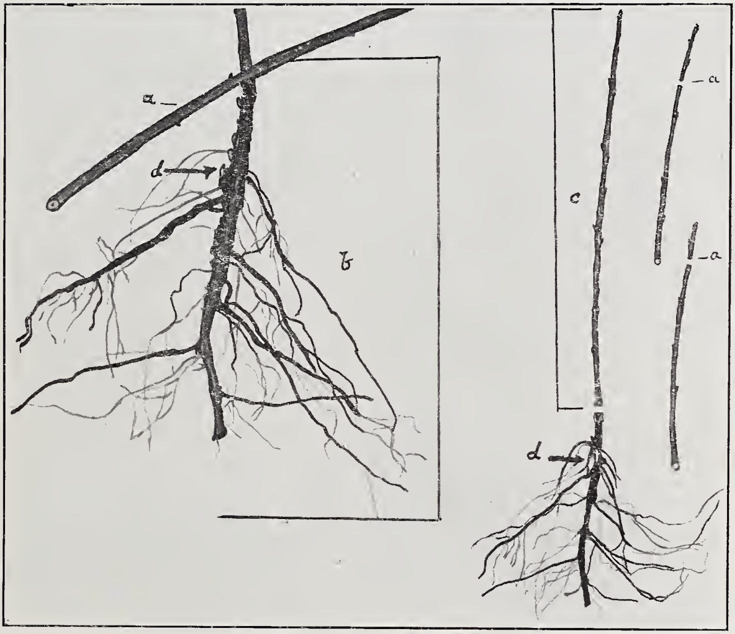
TRANSPLANTING THE SEEDLINGS TO THE NURSERY.

In the early autumn those plants which have made good growth during the summer may be dug up and planted out into the nursery. In fact some of the perennial flowers like Hollyhocks, Blanket flowers, Delphiniums, etc., will be big enough for the pupils to take home and plant around their homes that autumn. The following year they will give fine bloom and all perennial flowers will live for many years and give quantities of bloom each year. The shrubs, however, should not be distributed until they have made about two years growth in the school nursery. Then one autumn or early spring they might be all dug up, some planted to assigned places around the school grounds, and the others carefully distributed to the pupils or their parents. Hundreds of beautiful shrubs could thus be disseminated throughout the community.

The nursery strip, which is reserved to receive the plants as they are taken up from the seed bed, should be plowed, or dug, in the spring and should be kept well cultivated and free from weeds during the summer. It will then be in good condition to receive the young plants in the autumn. The nursery rows are made about three feet apart and the plants are put about twelve to eighteen inches apart in the rows. The nursery strip must be kept cultivated and free from weeds while the plants are growing. It should also be protected, if necessary, from being tramped on by the children. The children could be trained, no doubt, to take equal interest in their school seed-bed and nursery as they do in their school gardens, and they should be carefully instructed in the simple art of transplanting flowering shrubs.

WHAT TO SOW AND WHERE TO GET THE SEED.

Seed of only those shrubs and flowers which are beautiful, hardy and thrifty should be sown. In some localities the seed or cuttings of several native plants might be used to splendid advantage. The climbing Bitter-sweet, (Celastrus scandens) grows wild in many parts of Canada. It makes one of the very best hardy vines for verandahs and porches. It is easily raised from seed. The self-fastening variety of the Virginian Creeper which is the



THE TRANSFORMATION OF A CURRANT CUTTING.

a Cuttings 12 inches in length, inserted in soil up to mark (a).
b. Roots formed the following summer.
c. Top-growth made during summer.
d. Buds which will form additional shoots like (c) the second summer.

very best vine for covering the house is also found wild in many parts. It is easily raised from cuttings and the many thousands which have been sent out from the Central Farm have all been raised that way. The cuttings are taken from plants growing on the buildings around the Farm. They are taken just after the leaves fall in the autumn. Wood not quite as thick as a lead pencil is selected and cut into lengths a foot long. These cuttings are placed base downward in sand for the winter during which period a callous forms over the cut ends. In the spring they are planted out. They must be buried for about three quarters their length. Roots will then form, and later on, from the buds left above the ground, leaves will shoot out. Cuttings may be made from some other suitable plants, as given in the following list, in a similar manner, although in most cases where seed can be obtained it should be used. The seed of some shrubs which has a very thick seed-coat will not germinate until it has been left in the ground for one whole year, or longer, and, therefore, the seed-bed should not be dug up too hastily.

The Central Farm each year makes, for experimental purposes, a small distribution of such seed as is collected on the Farm grounds. Those teachers who wish to start work similar to that suggested in this article, and who make timely application for it, would be welcome to such seed as could be spared from the Farm collection. The quantity of such seed is, of course, limited.

Some of the trees, shrubs, and perennial flowers which could be most easily raised from seed, which are perhaps most suitable for school and home surroundings are as follows:

FROM SEED.

1. Trees:—
    - Sugar Maple.
    - White Spruce.
    - Green Ash.
    - Norway Maple.
    - Scotch Pine.
    - Manitoba Maple (for the Prairie Provinces).
    - Basswood.
    - Arbor-Vitae or Cedar.
2. Small Trees:—
    - Siberian Pea Tree.
    - Mountain Ash.
    - Japanese Tree Lilac.
3. Shrubs:—
    - Japanese Barberry.
    - Japanese Rose.
    - Bush Honeysuckles.
    - Wayfaring Tree.
    - Common Lilacs.
    - Snowberry.
4. Perennial Flowers:—
    - Columbines.
    - Shasta Daisy.
    - Blanket Flowers.
    - Phlox.
    - Hollyhocks.
    - Pinks.
    - Bell-flowers.
    - Sunflowers.
    - Foxgloves.
    - Oriental Poppies.
    - Larkspurs.
    - Coreopsis.

FROM CUTTINGS.

5. Trees:—
    - Poplars.
    - Willows.
    - Arbor-Vitae or Cedar.
6. Shrubs:—
    - Van Houtte's Spiræa.
    - Honeysuckles.
    - Flowering Currant.
    - Privet.
    - Mock Orange.
    - Dogwoods.
7. Self-fastening Virginian Creeper.

Note:—On account of the hardness and thickness of the seed coat of such seeds as the Basswood, and sometimes the Japanese Rose, it has been found that the seed when sown in the autumn, soon after ripening, will not germinate in the spring with the seeds of other plants. It remains dormant in the ground for a year and a half. Most of it will germinate, however, in the second spring.

Cuttings of the willows and poplars will root in any good moist soil, but those of the cedars and most of the shrubs will succeed best in a moist, sandy soil. All cuttings should be kept shaded.

Cuttings of currants, both the red and black varieties, will root very easily and the illustration shows how a cutting transforms into a plant in one year.

CONFERENCE OF OFFICERS.

FROM January 14th to 19th, there was held, at the Central Experimental Farm, Ottawa, a conference of officials of the Dominion Experimental Farms system. There were present, besides the director and the officers of the Divisions at the Central Farm, the following superintendents of the branch Farms and Stations distributed throughout Canada:—

J. A. Clark, Charlottetown, P.E.I.; W. W. Baird, Nappan, N.S.; W. W. Hubbard, Fredericton, N.B.; W. S. Blair, Kentville, N.S.; Jos. Begin, Ste. Anne de la Pocatière, Que.; G. A. Langelier, Cap Rouge, Que.; J. A. McClary, Lennoxville, Que.; W. C. McKillican, Brandon, Man.; W. A. Munro, Rosthern, Sask.; M. J. Tinline, Scott, Sask.; W. H. Fairfield, Lethbridge, Alta.; G. H. Hutton, Lacombe, Alta.; P. H. Moore, Agassiz, B.C., and G. E. Parham, Invermere, B.C.

A regular programme of sessions was arranged and carried out, wherein the various lines of work being pursued or soon to be incepted were discussed and planned.

An opportunity was given of hearing and meeting the heads of some of the other Branches of the Department of Agriculture, those present at the luncheons given at the Farm on Friday, Saturday and Monday being addressed briefly by the Veterinary Director General, Dr. Torrance; the Live Stock Commissioner, Mr. Bright; the Dairy and Cold Storage Commissioner, Mr. Ruddick; the Seed Commissioner, Mr. Clark; the Fruit Commissioner, Mr. Johnston, and the Dominion Entomologist, Dr. Hewitt.

NOTE.

An experiment was carried on during the past season at the Lethbridge Experiment Station to ascertain the shrinkage of alfalfa hay in stacks. On the 30th of June there was stacked 10 tons, 1,000 lb. of hay as drawn from the field. This stack, on the 2nd of January, weighed 9 tons, 250 lb., being a shrinkage of one ton, 750 lb., or about 15 per cent. The stack was 15 feet wide, 29 feet long, and when settled had an overthrow of 31 feet.

The subject of paramount importance in our correspondence and in the hearings is education. In every part of the United States there seems to be one mind, on the part of those capable of judging, on the necessity of redirecting the rural schools. There is no such unanimity on any other subject. It is remarkable with what similarity of phrase the subject has been discussed in all parts of the country before the Commission. Everywhere there is a demand that education have relation to living, that the schools should express the daily life, and that in the rural districts they should educate by means of agriculture and country life subjects. It is recognized that all difficulties resolve themselves in the end into a question of education.—*Report of the United States Country Life Commission.*

THE ENTOMOLOGICAL BRANCH.

SOME CANADIAN RODENTS INJURIOUS TO AGRICULTURE.

BY NORMAN CRIDDLE, FIELD OFFICER, ENTOMOLOGICAL BRANCH, DEPARTMENT OF AGRICULTURE, OTTAWA.

THE rodents are among the most injurious of the mammals. Small in size, but vast in numbers, they continuously pursue their work of destruction, causing losses which are impossible to estimate, but which in the aggregate must be enormous. Among the smaller rodents, rats and mice are the only ones generally recognized by the public, and of these the common House Mouse, *Mus musculus,* and the Brown Rat, *Epimys norvegicus,* are among the few that are well known. Both these species were introduced into Canada and have since become widely-spread, the former now being found over most of the continent, while the latter is rapidly following in the former's footsteps. Apart from these introduced animals, however, we have a number of native ones, some of them equally destructive and it is of these that I propose to deal with in this article.

Of native rats we have none, nor are there any other mice of the genus *Mus* in Canada, but of field mice there are numbers; indeed we have more than eighteen species of the genus *Microtus* alone, several of which are exceedingly injurious, though it does not follow that they are necessarily all so. For instance, Dr. Hewitt* records *Microtus agrestis* as destroying numbers of the Large Larch Sawfly cocoons in Great Britain; Dr. A. K. Fisher describes similar habits of *Peromyscus artemesiæ* in Michigan, while a third kind almost surely *Microtus drummondi* has been known to destroy fully 50 per cent of the sawfly cocoons in a certain swamp near Treesbank, Manitoba.

The following brief account will give an idea of the economic importance of some of our commoner rodents:—

Deer, or White-footed Mice, (*Peromyscus* spp.) destroys grain, particularly in the stook; they also enter farm buildings devouring grain and various other substances. In the north, the Arctic Deer Mouse (*P. borealis*) is said by Preble* to take the place of the House Mouse by entering dwellings, etc., at traders' posts.

The Red-backed Voles (*Evotomys* spp.), like the White-footed Mice devour much grain, being especially troublesome while grain is in the stook or stack. They also injure young trees.

The Field Vole, (*Microtus pennsylvanicus*) is very destructive in parts of eastern Canada. Besides destroying cereals, it gnaws the bark off various trees, including apples.

Drummond's Vole, (*M. drummondi*) prefers low lands. It is stated by Preble† to have overrun much of Saskatchewan and Alberta, in 1900, causing great loss to crops. Various races are met with throughout the country, all having very similar habits.

Pocket Gophers, (*Thomomys* spp.) are very destructive everywhere in western Canada, east of the Rockies. They make long subterranean tunnels near the surface and throw up heaps of earth not unlike those of a mole, for which animal they are frequently mistaken. In reality, however, there is no close relationship between the two. True moles are insectivorous in their food-habits and are therefore useful, whereas Pocket Gophers live almost entirely upon vegetable substance, their diet consisting of roots, including potatoes, carrots, parsnips, turnips, etc., and of grain including all the cereals. In their efforts to get at the latter they often partly bury stooks, destroy the bands of the sheaves, and cut off the grain heads, which they store with other food for winter use, using the pockets in their cheeks for the purpose of carriage. These destructive rodents are almost wholly nocturnal in habit, doing most of their work during the darker hours between sunset and sunrise. Excepting during the breeding season and while the young are still immature, there is seldom more than one animal in the same net-work of burrows, while towards autumn, the young either leave of their own accord or are driven forth by their mother. They then wander over the country until finding a favourable feeding ground, they commence new burrows, being, owing to this habit, of particular annoyance to farmers and gardeners. Pocket Gophers may be poisoned by soaking pieces of any of the roots mentioned above in poison, such as is given out by various municipalities, or in a strichnine solution and then placing the roots in the runways. The most satisfactory method of controling them, however, is by systematic trapping with ordinary gopher traps. For this purpose no bait is required but a little practice is necessary before proficiency is attained.

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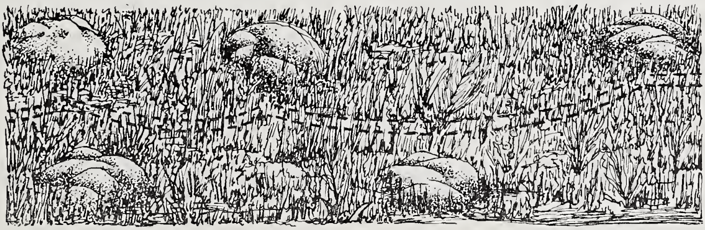
*The Large Larch Sawfly, Bul. No. 10, Div. of Ent., Dept. of Agriculture.

*North Am. Fauna, No. 27, U.S. Dept. of Agriculture, 1908.

†North Am. Fauna, No. 27, U.S. Dept. of Agriculture, 1908.

Jumping Mice, (*Zepus* spp.) are not common, but occur most frequently in the neighbourhood of low bush land. They do some mischief to grain in the stook.

Gophers or ground squirrels. These animals are entirely western, none being found east of Manitoba unless in the extreme north. There are about ten species or subspecies in western Canada, some of which cause immense loss to the farming community amounting to thousands of dollars annually. Three species are particularly prominent in this work of destruction; namely, the Scrub, or Franklin's Gopher, (*Citellus franklinii*), the Prairie or Gray Gopher, (C. *richardsoni*), and the Striped Gopher, (C. *tridecemlineata*). Of these, the first named has a fairly wide range and extends over most of the semi-wooded area of Manitoba, Saskatchewan and Alberta to as far north as Athabaska Landing in the latter province. It readily attacks growing grain and also the ripened products, but is seldom found far



HILLS OF THE POCKET GOPHER, SHOWING POSITION BY DOTTED LINES OF CONNECTING SUBTERRANEAN TUNNEL.

Modified Figure from Farmers' Bulletin No. 484, U.S. Dept. of Agriculture, Washington, D.C.

from the bushy wood-lands in which it makes its home.

The Prairie or Gray Gopher is by far the most destructive of any found in Canada. It ranges over practically the whole prairie area from Manitoba to the Rockies, at places in such numbers as to clear off the entire crop. This is particularly so of the newer settled districts to which the animals are said to come in thousands from the adjacent prairies to the newly sprouting crops, making it impossible for individual settlers to cope with them.

It is difficult to get at the exact figures as to the abundance and destructiveness of gophers, but Mr. Power, Secretary-Treasurer of the Municipality of Pipestone, Manitoba, has very kindly supplied me with some data in this respect which will give an idea how numerous these animals are even in western Manitoba. In the above mentioned municipality bounties ranging from one to three cents a head are given for gophers, the larger sum being supplied during the breeding season only. As a result of this bounty 72,578 animals were accounted for during the summer of 1913, and in 1914 more than 85,000 had been destroyed before the season closed. This does not, of course, include the gophers killed through the distribution of free poison. Yet, in spite of all these precautions, there is said to be no marked decrease in the numbers of individuals in comparison to previous years.

The Striped Gopher is much less common than the Prairie Gopher, and in habits is somewhat intermediate between that species and the Scrub Gopher. It has, however, a wide range in the Prairie Provinces but confines its attack far more to the ripened grain and less to the plants while they are growing. The injury it does, however, is by no means insignificant and unless kept in check it soon multiplies to destructive proportions.

Several other species of gophers are found in the north and extreme west. *C. columbianus* and the variety *albertæ* occur in the foot-hills of the Rockies, east to Maple Creek, Saskatchewan, and west well into the mountains. Two kinds are found in the extreme north around Hudson Bay and at the mouth of the Mackenzie River, but these last, it is interesting to know, are actually considered of value by the Indians for food purposes.*

The remedies for gophers are numerous, those most frequently in use being the various poisoned baits, of which the more practical are given below:—

Strichnine.............	1 ounce.
Molasses..............	½ pound.
Wheat................	1 bushel.

Dissolve the strichnine in sufficient warm water to soak the grain without leaving a surplus of moisture. When used at once drying is unnecessary, but the grain should be dried quickly if it is to be kept any length of time, otherwise it will become musty or sour.

Another bait, probably the best of all, is made as follows:—

Strichnine (powder).....	¼ ounce.
Tallow................	10 pounds.
Salt..................	1 ounce.

Melt the tallow by heating and add the strichnine and salt. Keep heated until all is thoroughly mixed, then pour into a convenient receptacle to cool and afterwards cut into small lumps for placing in the gopher's holes. All such baits should be placed in burrows showing recent signs of being inhabited and in quantity sufficient for one meal. The practice of scattering poisoned bait promiscuously around about burrows is not only dangerous but wasteful; it also destroys many useful birds.

Another method of destroying gophers is by trapping and there are few ways that prove more successful when the work is systematically carried out. Apart from the ordinary steel traps these animals may be easily captured by means of a string noose placed at the entrance of a burrow with the end held in the hand a short distance away. Then, as the gopher inquisitively pokes out its head, the noose is jerked tight, thereby securing the animal around its neck.

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*Preble, North Am. Fauna, No. 27, U.S. Dept. of Agriculture, 1908.

Shooting is also an excellent method of reducing the numbers of gophers, the weapon most frequently used being a 22 calibre rifle. Hundreds may be secured in a day by this means at comparatively small cost.

As is the case with all our pests, however, be they mammals or insects, some sort of co-operation is necessary to reduce them to comparatively harmless numbers and it is only by some method of this sort that we can expect to be successful in our efforts. In this respect there is no doubt that gopher clubs organized along lines similar to sparrow or crow clubs, would aid much in reducing the pests and be of unquestionable value, which, however, cannot be said of crow clubs.

Chipmonks (*Eutamias* and *Tamias* spp.) are very destructive to grain and various garden seeds in the neighbourhood of woodlands; as a rule, however, they are not sufficiently numerous to cause widespread injury.

Squirrels (*Sciurus* spp.) steal everything available in the nature of grain, particularly where the same is not tightly housed. They also destroy eggs and young birds. While widely spread, however, they are seldom numerous enough to cause extensive loss.

Beavers (*Castor* spp.) cause inundation of low lands by means of their dams. They also destroy much timber.

Jack Rabbits or Prairie Hare (*Lepus campestris*) are injurious to various shrubs, apple trees, etc.

Varying Hare or Bush Rabbit (*Lepus Americanus*) attacks oats and other grain in the vicinity of woods; they are also destructive to gardens in summer, and in winter attack apple trees and other shrubs besides causing immense injury to young forest trees.

Cotton-tail Rabbit (*Lepus nuttalli mallurus*) has habits somewhat similar to the last mentioned species, but is less destructive and not so widely distributed.*

An account of noxious mammals would hardly be complete without reference to some of the animals that prey upon them, many of which are still destroyed through lack of knowledge concerning their habits. To begin with, there is a good word to be said in favour of Coyotes (*Canus lutrans*) and of foxes which, while doing much harm to poultry, as well as in the case of the former, to sheep, are nevertheless persistent hunters after rodents particularly rabbits, and thus largely compensate for the harm they do at other times.

The most useful of all our mammals, however, as destroyers of rodents are the various weasels, which curiously enough, are generally regarded only in the light of destroyers of poultry, whereas in reality they are only casual enemies in that respect and very great friends in every other.

The Least Weasel (*Mustela rexosa*) occurs over much in the prairie provinces north almost to the arctic circle. It is wholly beneficial and on account of its small size can easily follow mice along their runways. Fortunately the lack of a black tip to its tail protects it somewhat from the demands of fashion, though it falls a prey to the traps set for larger species.

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*The economic value of the mammals mentioned above, apart from their relations to agriculture have been purposely omitted. In many instances, however, their uses for food and fur cannot, of course, be questioned.

Bonaparte Weasel (*Mustela cicognanii*) lives upon rats, mice, pocket gophers and common gophers. It has been known to live in buildings occupied by poultry without molesting them, and while it might, through hunger, kill an odd chicken, we have no actual evidence of it having done so. There is probably no more useful wild mammal in Canada.

Richardson's Weasel (*M. richardsoni*) is more of an eastern animal, it is rather larger than the last mentioned with very similar habits, though its greater size may induce it to more frequently attack larger game.

The Eastern Weasel (*M. novaboracensis*) is another useful kind living largely upon mice and rats.

The Long-tailed Weasel (*M. longicauda*), with its close allies, undoubtedly takes poultry at times, though it has also been known to occupy buildings inhabited by those birds without touching them. It is, however, the criminal for which others have often been blamed. Usually the food of this weasel consists of all the smaller rodents and includes hares or rabbits.

Without doubt much of the depredations at present caused by rodents are directly due to the lack of knowledge regarding weasels, but probably still more to the demands of fashion. At the present time hundreds of men and boys are busily engaged in trapping those animals for the price of their fur, in doing which they are causing a loss far in excess of the value paid for the skins. Viewing the question from an agricultural standpoint there is no question but that these animals should receive some protection.

Several other weasels occur in Canada, the habits of which probably do not differ very greatly from those discussed above, all, however, are becoming scarce through systematic trapping.

The value of Hawks and Owls as destroyers of rodents has been discussed frequently and should be known to everyone, though unfortunately this does not seem to be the case, and we still find that with most people, the occasional rading of a poultry yard is sufficient to condemn all species. Education is still very necessary to enlighten the general public of the folly of such proceedings.

THE FRUIT BRANCH.

PACKING SCHOOLS.

BY DONALD JOHNSON, FRUIT COMMISSIONER.

IN order to secure greater uniformity of judgment among the temporary fruit inspectors in regard to the grading and packing of fruit, a short course in packing was arranged for the Ontario staff. As the temporary inspectors for the Prairie Provinces were returning East in December, it was thought desirable to arrange this packing school so that they could join the Ontario inspectors for a week's instruction.

The school opened on December 14th, with twenty-one temporary inspectors in attendance, and the first few days were devoted to the actual packing of fruit. Each inspector, under the instruction of Mr. P. J. Carey, Chief Packing Expert for the Department, was required to show his ability to sort and pack apples in barrels as well as to grade, wrap and tier apples in boxes. The success of the school was most gratifying and it was found that all the men were able to put up a splendid pack of apples, showing that they were well qualified for their work. In the evenings lectures were given by permanent members of the branch on the work in general, with special reference to all phases of the Fruit Marks Act.

The charge has sometimes been made that the inspectors operating in the Western Provinces condemned fruit that was passed by the inspectors in Ontario. While there was no ground for such criticism, yet it was felt that the interchange of ideas between the men working at the producing end and those located in the distributing centres of the West would be to their mutual advantage, and would entirely do away with the possibility of any similar criticism in the future.

A course along the same lines is being arranged for the Inspectors in Nova Scotia in charge of Chief Inspector Vroom, who will be assisted by Mr. A. H. Flack, Chief Fruit Inspector for the Prairie Provinces. In addition to special instruction in box packing from Mr. Flack, it is felt that he will be able to give the Nova Scotian inspectors much valuable information regarding the markets of the West which their fruit is only now reaching in large quantities.

BOX PACKING DEMONSTRATIONS.

Mr A. H. Flack, Chief Fruit Inspector for the Prairie Provinces, who is also an expert box packer, having received his experience in the packing houses of the Pacific Coast, spent a week (January 7th to 14th) at the Truro Agricultural College, where he instructed both the Short Course and the Long Course students in the art of packing in boxes. Other packing demonstrations are being arranged by the provincial authorities for Mr. Flack while he is in Nova Scotia.

THE SEED BRANCH.

THE CORN SITUATION.

DURING the last few years the Seed Branch has given special attention to the problems relating to the corn crop, particularly that grown for ensilage. The inspection of seed offered for sale by dealers throughout the country and the field work done by the Seed Branch district officers have clearly shown that the great need of the ensilage growers is an abundant supply of seed corn of strong vitality and of a variety and strain suited to the conditions under which it is to be grown Numerous partial or total crop failures have come through using seed that would not grow, and as a result many farmers have adopted the practice of sowing much more seed than would be required if it were all vital. If the seed is good, this heavy sowing gives too thick a stand, which, if not thinned, produces a crop poor in quality through failure of the ears to develop normally. In many instances poor crops result from using late varieties and strains which will not mature sufficiently to make good ensilage.

Until a few years ago, nearly all the available seed corn came from the United States. Some of it was of named varieties fairly well suited to Canadian conditions, but a great deal was ordinary commercial grain imported in carlots and often representing large late varieties grown in the central southern states. Such seed was entirely unsuited for Canada on account of the variety and origin, and often the vitality was injured by heating.

The necessity for a better seed supply directed attention to southwestern Ontario as a possible source of acclimatized seed. Dent corn is grown extensively in the extreme southwestern part of the province, particularly Essex County, and recently many growers have been endeavouring to produce good seed in commercial quantities. The Seed Branch has given all possible assistance to this work. The district officer for western Ontario has given particular attention to the corn situation and much work has been done in the seed laboratory. It was soon found that most of the corn produced in southwestern Ontario was rendered unfit for seed by lack of proper storage facilities and insufficient drying. Except small quantities given special care by the grower for his own seed, practically all the corn was stored in the ordinary cribs. Unless it was well matured before it was put into the crib, the circulation of air was not sufficient to dry the corn enough to prevent injury to vitality through mould or frost.

STORING AND DRYING.

In order to secure information in regard to practical methods of storing and drying seed corn in commercial quantities, the Seed Branch district representative for western Ontario, with three members of the Ontario corn association, made a tour of inspection through Illinois, Indiana and other corn growing states. From practical growers and agricultural colleges much valuable information was secured. The general conclusion reached was that any building provided with good ventilation and so arranged that the corn can have free circulation of air around individual ears would be suitable for Canadian conditions. Artificial heat is not required unless under exceptional circumstances. The information secured in respect to drying methods has been conveyed to many farmers' clubs and other organizations in the corn growing districts, through demonstrations at exhibitions and other means, and many growers have devised efficient and practical methods. One of the growers who made the trip of inspection built a drying house 16 x 150 feet for the 1913 crop. The seed stored in this building dried well although the autumn was unfavourable. In the early spring of 1914 the corn was sampled by Seed Branch officers for germination test. The average germination of the 570 ears tested was 99½ per cent, with 560 ears germinating 100 per cent. To encourage efficient drying methods, financial assistance toward the erection of corn drying houses has been offered to farmers' clubs.

SPECIAL SEED INSPECTION.

With the object of securing information in regard to the germinating qualities of the available seed in southwestern Ontario and protecting purchasers against shipments of poor lots, special seed inspection work was done last spring. Samples were collected from a large number of growers who had seed for sale and germination test reports were sent them. Over 4,400 individual ear tests were made, representing several thousand bushels of corn. In most cases the germination was satisfactory, but several lots were found with vitality below the legal requirements, due to immaturity and insufficient drying.

Just previous to planting time in 1914, an extensive inquiry was conducted throughout Ontario and the corn growing parts of Quebec to secure information in regard to the varieties grown in different districts; where the seed was secured, whether from dealers, direct from growers or homegrown; if purchased, whether shelled or on the ear; the area planted, and whether in hills or drills. About 1,900 lots of seed were reported, representing 11,000 acres planted, and nearly 1,700 samples were collected. All the samples were tested for germination, the average being 87 per cent. The corn purchased on the ear averaged 6 per cent higher germination than the shelled, the proportion germinating 90 per cent and over being 26 per cent higher. A summary of the results of this inquiry was presented in the October number of the AGRICULTURAL GAZETTE and further details will appear in a bulletin now being printed.

One of the facts emphasized by the inquiry was the large number of growers using unsuitable varieties and the lack of definite information in regard to the varieties best suited to different districts. The latter question is one of the most important in connection with the corn situation. Last spring, in co-operation with the Ontario Department of Agriculture, assistance was given in organizing a series of variety tests, in an attempt to secure the needed information. Seed of the leading recommended varieties was secured from reliable growers in southwestern Ontario and distributed to a number of the provincial district representatives who arranged with five or six farmers to grow one-eighth of an acre of each variety. The work last year was of a preliminary nature but some suggestive results were secured. These field tests will likely be extended to many more counties in the coming season and it is expected that they will be commenced in the corn growing parts of Quebec.

THE HEALTH OF ANIMALS BRANCH.

MUNICIPAL ABATTOIRS AND PUBLIC HEALTH.

BY F. TORRANCE, B.A., D.V.S., VETERINARY DIRECTOR GENERAL.

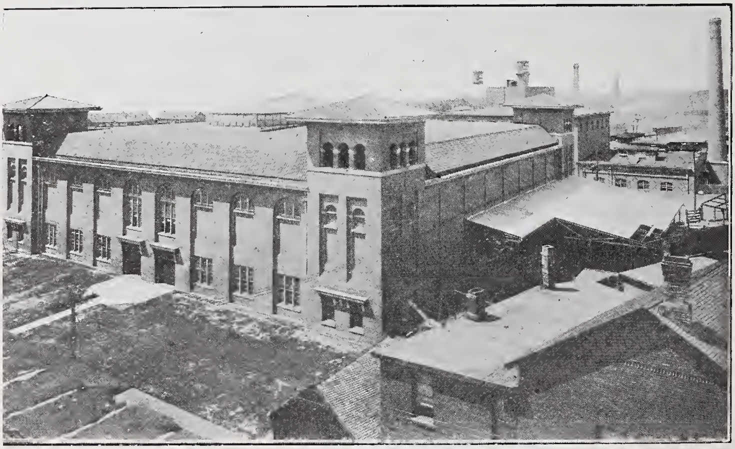
THE importance of a pure food supply for any population is so great that it hardly needs any argument. All progressive communities have taken steps to see that such articles of food as are most likely to be adulterated shall be properly inspected, and no city or town of any importance is not provided with inspectors of meat, milk and other foods.

The older communities have made much progress along these lines and vast improvements have been attained in their food supplies. In newer communities, such as those on this side of the Atlantic, while the milk supply is generally receiving more or less consideration, the meat supply is still in a very primitive condition. This is largely due to the ignorance of the public to the dangers that may lurk in uninspected meat, to the fear that a proper system of meat inspection may be too costly for their resources, and sometimes to the opposition of those whose interest lies in maintaining things as they are.

The inspection of meat is necessary from many points of view, but chiefly for the preservation of the public health against such diseases as may be communicated from diseased meat.

Inspection of meat after it has been prepared for the consumer is far from being efficient, and as a protection against the communication of disease, is of little practical value. A skilful and unscrupulous butcher can easily remove all evidence of disease from a carcass of meat in nine cases out of ten, and the meat so prepared would easily pass the scrutiny of the average meat inspector.

The only inspection that is of any value is that which is conducted at the time of slaughter before the butcher has had the opportunity of removing the diseased organs from the carcass. Considerations of this kind have led many municipalities in the older countries to establish municipal abattoirs, where meat is killed under the supervision of appointed officers, and in many cases these municipal abattoirs have been in successful operation for a great number of years.



CIVIC ABATTOIR, TORONTO.

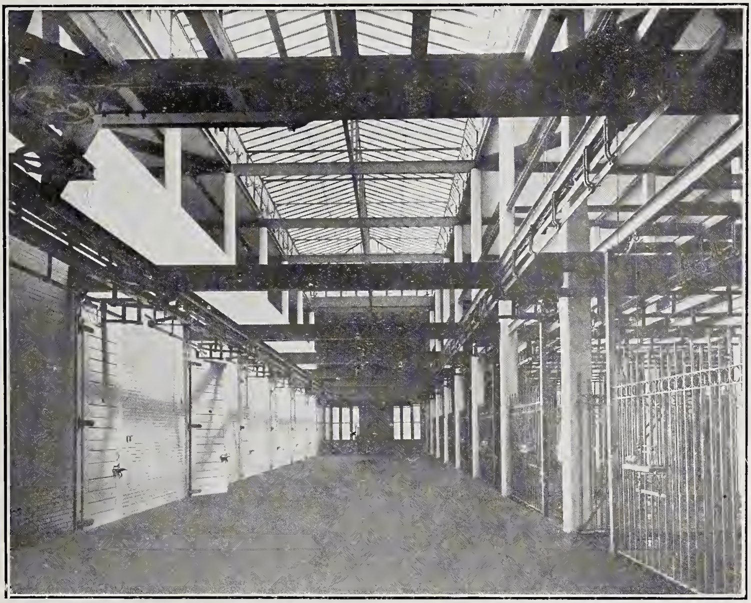
In addition to the protection of the public health against disease there are several minor advantages resulting from municipal abattoirs that deserve consideration. Cleanliness is highly desirable with regard to a food product as easily contaminated as meat, and this can only be attained where the necessary facilities are provided,—an ample water supply, good drainage, proper construction of floors and walls, screening of openings against the entrance of flies.

The municipal abattoir also gives great advantages with regard to economy in operation and efficiency of supervision. Under ordinary conditions of the primitive slaughter-house much valuable material is thrown away and wasted. This can be manufactured into valuable products and in a large establishment the manufacture of fertilizer, of special grease, bone meal and other products, produces a valuable part of the revenue.

Supervision is also much more easily provided where the slaughtering of animals for a community is done under one roof rather than in many widely scattered establishments. The concentration of the work and its performance at certain hours renders supervision an easy matter.

An improvement may also be expected in the quality of meat prepared at a public abattoir. Butchers will be more careful in their purchases when they know that their meat is to be inspected and condemned if found unwholesome.

There is also a great advantage in the facilities provided for chilling and cooling meat in a large abattoir. These facilities are generally absent in small slaughterhouses and the fresh killed meat is often carted through dusty streets to the butcher's establishment before it is cooled. Proper cooling of meat soon after killing adds to its quality and wholesomeness.



CIVIC ABATTOIR. INTERIOR SHOWING COOLERS ON LEFT, KILLING FLOOR ON RIGHT.

The experience of the Health of Animals Branch in the inspection of meats at the abattoirs under federal supervision, shows conclusively the great importance of this service. Probably about one-half of the meat consumed in Canada is subject to this inspection. During the year ending 31st of March, 1914, this inspection was given to 531,994 cattle, 1,799,000 swine, 499,000 sheep, and of this number there were condemned 7,177 carcasses of cattle, 4,007 carcasses of pork, 399 carcasses of mutton.

In addition to these carcasses totally condemned, there were the following number of portions of carcases condemned:—

119,742 portions of beef.
521,097 " " pork.
106,274 " " mutton.

It would be safe to assume that if this meat had not been inspected, some of it at least would have found its way into the stores and been sold for food. The temptation to the butcher to trim off diseased portions and sell the rest of the carcass is very great, and it is only by strictest supervision that this can be prevented.

Besides actual disease there are many conditions which render meat unwholesome, one of the chief of which is immaturity. Farmers and others endeavour to sell calves for veal before they have become sufficiently mature to furnish wholesome food. Over 3,000 of these calves were condemned last year by our inspectors and undoubtedly the majority of them would, under other conditions, have found their way into the food supply.

The expense of establishing a municipal abattoir is not so great as to over-ride its manifold advantages. No city with efficient government should be without its civic abattoir. The investment should be looked upon from the same point of view as the money spent in providing pure water for the use of the citizens.

If the abattoir is self-supporting, so much the better; if not, the deficit may be looked upon as the price the citizens have to pay for protection against impure food and money well spent. Wherever an abattoir is well planned and well managed, it should produce a revenue rather than a deficit. The revenue is derived as follows:—

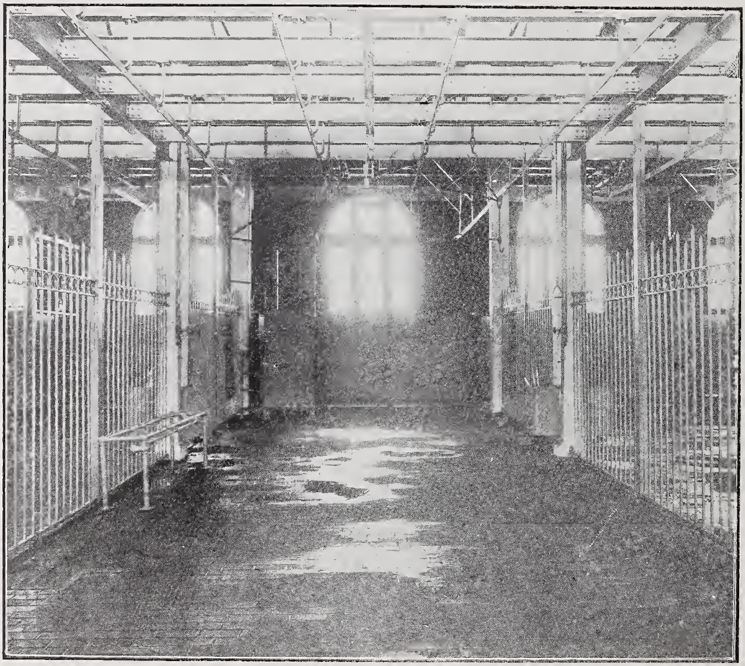
(1) The fees paid by the butchers for the use of the facilities of the abattoir.

(2) The fees derived from the slaughter of animals by the employees of the abattoir for persons bringing live animals there for that purpose.

(3) The profit to be derived from the rendering works in connection with the abattoir.

(4) The rentals derived from the cold storage branch of the establishment.

These sources of revenue should go far towards paying all the operating and other expenses of a municipal abattoir, and where properly situated and efficiently managed



CIVIC ABATTOIR. INTERIOR OF ONE OF THE PRIVATE KILLING FLOORS.

should show a profit on the investment.

It is difficult to point to the experience of other places in Canada or the United States along this line of civic activity, for the reason that up to the present time comparatively few municipal abattoirs have been established in America. Comparisons might be made with municipal abattoirs in England, Germany, France and other countries, where they have been operating for many years and giving great satisfaction to the people.

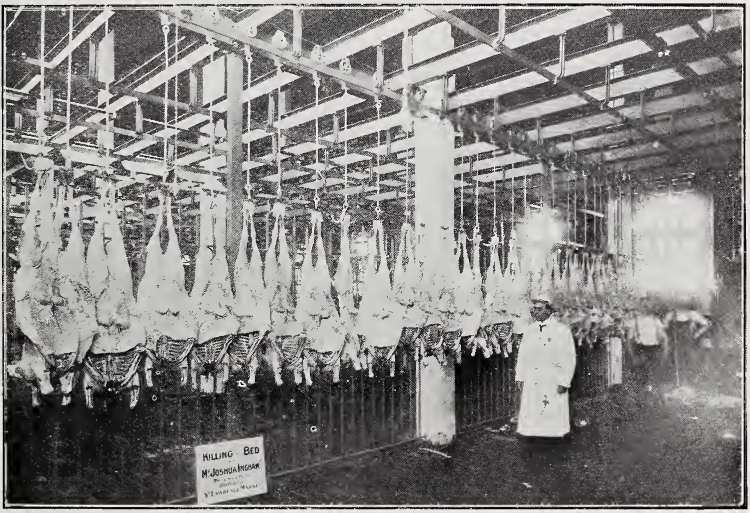
Conditions in America, however, are very different to those in Europe, and such comparison would be of little value in guiding Canadians as to what is needed under the conditions of our country.

As an indication, however, of satisfactory operation of a plant on a small scale the experience of Paris, Texas, may be cited:—

In February of 1910, Mr. Ed. H. McCuiston, Mayor of Paris, Texas, stated, with respect to the municipal abattoir in his city:—

"The City of Paris began the operation of a municipal abattoir on the first day of December, 1909, and we are delighted both with the service rendered and the plan which we are pursuing. Our plant consists of an abattoir and cold storage house, which in height is two stories, also a reduction plant, which is operated with the same machinery and under the same roof, but in different departments.

"We have never undertaken any enterprise which has commended itself to our people as strongly as our abattoir and reduction plant. When we undertook to vote bonds for it there was quite a good deal of opposition among all our people. Both the plant and the plan were considered impractical and visionary, but there is not now, so far as I have been able to hear since we began operations, a single dissenting voice, and our people appreciate it more than any improvement we have ever undertaken."



CIVIC ABATTOIR. INTERIOR OF PRIVATE KILLING FLOOR SHOWING DRESSED CARCASSES. FEDERAL MEAT INSPECTOR IN WHITE COAT.

After making the above statement and after two years' of operaton, Mayor McCuiston, says:—

"Our municipal abattoir continues to be

the same howling success as it was the day we started it. It has grown in popularity with our people and in favour with our meat cutters with every passing month."

Toronto is the first Canadian city to establish a civic abattoir. This was put in operation in July, 1914. Statistics are not available, showing the expenses of maintaining it, but the manager assured the writer last summer that the amount of business which they were doing was sufficient to warrant the statement that the abattoir would be a paying proposition much sooner than had been expected. This coming so soon after the inauguration of the establishment is highly satisfactory. If events justify this statement Toronto will set an example to other Canadian cities which they should follow as soon as possible.

Toronto applied for federal inspection and this was granted, so that the establishment has been under the inspection of the Health of Animals Branch since its inception.

Under the Meat and Canned Foods Act the Federal Government will furnish inspection to all abattoirs slaughtering meat for export from one province to another, or to foreign countries, and almost any civic abattoir will be able to take advantage of this provision of the law, provided the business transacted is of sufficient volume to warrant the expenditure. This would relieve the city of the expense of meat inspection and would also provide that civic inspection would be uniform with federal inspection.

Another advantage is attained in that Federal Inspection includes not only the meats intended for export, but every food product prepared in the establishment under inspection. The premises are required to conform to a certain standard of construction and to be maintained in a cleanly, sanitary condition. All animals slaughtered in it are examined both before and after death, and nothing is allowed to go out for human consumption without the mark "Canada Approved," showing that it is clean and wholesome.

EMBARGO AGAINST FOOT AND MOUTH DISEASE.

THE original embargo of November 9th, 1914, prohibited the importation into Canada of "animals, or of the flesh, hides, wool, hoofs, horns, or other parts of animals, (with the exception of cured meats, lard and tallow), or of hay, straw, fodder or manure." Subsequent orders have modified this regulation in several particulars, and for the information of the public, the following synopsis has been prepared:—

Cattle, sheep, goats and swine are still prohibited.

Horses for special use in breeding, racing, or under exceptional circumstances may be admitted by order of the Veterinary Director General, to whom all applications must be made.

Dogs may be admitted, with the exception of such breeds as are used in hunting, shooting, or herding sheep or cattle.

Poultry. Only live pure bred poultry for breeding purposes may be admitted. The shipment must be accompanied by the affidavit of the owner or shipper that the said poultry have come from an establishment where no cattle, sheep or swine are kept, and from a district not included in the closed area under Federal Quarantine. Crates containing poultry must not contain either hay, straw or chaff.

Wool and hides. Certain classes of wool and hides are admitted under special conditions. Importers can obtain full information by writing to the Veterinary Director General.

Hay and straw are excluded, with the exception of what is used in packing fragile merchandise. In case this is from the United States an affidavit must accompany the shipment that the said hay or straw was harvested prior to August 1st, 1914, and has not been in contact with any infected animal or material.

Milk and cream are prohibted, unless accompanied by a certificate of pasteurization signed by an officer of the Bureau of Animal Industry or by a local health officer. Milk cans returning empty to Canada from the United States must be sterilized.

The following are admitted without restriction :— *Horse-hair* for brush and mattress making, *feathers* for bedding manufacturers, *cooked meats* such as sausages, *skins* of *wild fur-bearing animals, pet birds, live pigeons, menagerie* and *wild animals except deer, pet cats.*

Manure is prohibited.

THE DAIRY AND COLD STORAGE BRANCH.

HOW THE QUESTION OF PAYMENT FOR CHEESE MILK WAS SETTLED AT THE FINCH DAIRY STATION.

THE matter of deciding as to the plan to be followed in distributing the proceeds from the sale of cheese at the Finch Dairy Station was one of the practical problems which the management of that establishment has had to deal with. Up to the time when the business was acquired by the department, the milk had always been "pooled," or in other words, payment to individual patrons had been based only on the weight of the milk delivered. The officers of the Dairy Division have always advocated the payment for cheese milk on a quality basis, and for the sake of consistency, if for no other reason, they were bound to introduce the more up-to-date method at Finch. The question was submitted to the patrons at a meeting called for the purpose, and a majority decided in favour of payment according to the percentage of fat plus 2, which plan was adopted for the season of 1913. Some of the patrons, whose milk tested below the average, became dissatisfied with the results, and in the spring of 1914 a demand was made by about half of them for a return to the old system. It was intimated that if the demand was not acceded to, a large number of the patrons would leave the factory. On the other hand, those patrons who were in favour of "paying by test" were just as insistent that that system should be continued. What was to be done? The Dairy Division was bound to favour the just and progressive method, and yet one of the objects aimed at in operating the factory was to show that increased patronage would follow good business management. Finally, the following plan was adopted to meet the situation arising over the difference of opinion among the patrons on this question. It was agreed to operate the factory on both systems, giving the patrons the choice of having their milk pooled, or paid for on a quality basis, the two lots of milk to be manufactured separately, just as though there were two distinct factories. When the day arrived on which the new arrangement was to be inaugurated, not a single patron offered his milk at the "pooling" delivery, every one preferring to take chances with the system of payment according to quality. Not a word has been heard on the subject since. Those patrons who find their milk testing below the average, are now wisely considering means to breed a little more fat into it, and there is no doubt they will be able to do so.

PROSECUTIONS UNDER THE DAIRY INDUSTRY ACT, 1914.

A butter dealer of Montreal was convicted in December for selling butter containing over the legal limit of 16 per cent of water. The same dealer has recently been convicted under Section 5 of the Act for deliberately mixing water with butter. The minimum fine of $200.00 and costs was imposed. The fines and costs of both cases amounted to $487.45. The Chief Inspector of Dairy Products, Mr. J. F. Singleton, was the prosecutor. It is becoming rather a dangerous business, under the new Dairy Act, to attempt this form of fraud.

Down through the centuries has come the widening reign of liberty and law, and however bitter the cost, and however long the struggle, there is no man in this room that can doubt the final result. We have sent and are sending our sons and brothers, but we cannot all be in that fierce battle line. It remains for us, who are left behind, to broaden our sympathies, to bear each other's burdens, and to direct our efforts to sustain those who are bearing the brunt of the fight. We cannot do it better than by ensuring a full measure of the necessaries of life to those who are in the front. It is our duty, not less than Britain's, to see that not a sailor in the fleet or a man in the trenches shall lack a single one of those things which he so sorely needs. Russia, that great producing country, must necessarily yield less with its millions drafted to the war; Belgium as a producing factor is obliterated from the map; Britain, always unable to sustain itself, will have stronger needs; that beautiful section of France, where a little more than a year ago I saw the countless shocks of golden grain, is now scarred with deep dug trenches. Surely, surely, there is need for all we can do. On the lower grounds, I urge again, that it will pay the producers of this country to extend their work, but on the higher grounds I make the still stronger appeal that, even if it were an open question as to whether a man by producing more from his farm could make a profit thereby or not, yet if there be the faintest doubt as to an ample food supply for those millions who are heroically doing our work, then in Heaven's name, let us remove the doubt and do our full share in retaining for ourselves and our children the institutions, liberties and civilization whose blessings we share to-day.—*Hon. Martin Burrell, at Agriculture and Live Stock Banquet.*

OBITUARY.

As The Agricultural Gazette was going to press word was received of the death in St. Catharines, on Tuesday, February 9th, of Mr. Robert Thompson, President of the Ontario Fruit Growers' Association and Manager of the St. Catharines Cold Storage and Forwarding Company.

PART II.

Provincial Departments of Agriculture.

INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL DEPARTMENTS OF AGRICULTURE INCLUDING AGRICULTURAL COLLEGES.

CORN GROWING.

PRINCE EDWARD ISLAND.

BY W. DAVISON, B.S.A., INSTRUCTOR IN FIELD HUSBANDRY.

OWING to a cool, late summer corn does not often mature on Prince Edward Island. Mr. Frank Glydon of Margate, who has been growing corn for the last eighteen years, has had better success in maturing seed than any other man in the province. He has ripened seed for a number of seasons, but has met with several failures, notably in the season of 1913. On the whole however, no seed corn of any consequence is saved here.

Mr. J. A. Clark has been testing varieties on the Experimental Farm for the last five years. In these tests Longfellow and Compton's Early have stood out well, but definite conclusions can hardly be drawn as yet.

While it is difficult to mature seed, corn can be grown for ensilage purposes with a good deal of success. Those men who grow this crop can harvest from fifteen to twenty tons of ensilage per acre in a good season and would not be without it. Longfellow is the variety used almost altogether and seems to give the best results.

To get good results, it is necessary to grow corn on sod land, preferably where a good deal of growth can be turned down. This in rotting seems to give heat to the soil which is otherwise lacking and which is so essential to the rapid growth of the crop.

NOVA SCOTIA.

BY JOHN M. TRUEMAN, B.S.A., PROFESSOR OF AGRICULTURE, AGRICULTURAL COLLEGE, TRURO, N.S.

ALMOST every market gardener in Nova Scotia grows with success the common Canada yellow or one of the sweet varieties of corn for domestic purposes. These varieties are, however, too small for ensilage purposes.

Corn has been grown for ensilage on the College Farm at Truro for over twenty years, but at the end of this period we would hesitate to recommend farmers throughout the greater part of the province to build silos and grow ensilage corn. The seasons are generally too short. Looking over our results for a period of over two decades, I find that only the ears of such varieties as the Compton's Early or Longfellow reached the glazed stage only about one year in four.

The best success has been obtained with the flint varieties such as Compton's Early and Longfellow, but so frequently have these comparatively early sorts failed to come to maturity that, for a number of years, the farm manager has made a practice of planting from one-third to one-half of the acres grown with the common Canada yellow. The mixture of this well matured corn with the larger growing but less matured varieties has proven very satisfactory. The average yield, however, has only been about 12 tons per acre, the Compton's Early and Longfellow giving about 15 tons and the Canada yellow 8 to 10 tons.

In the Annapolis Valley and in some of the counties along the south shore of Nova Scotia very much better results have been secured than at Truro and in the eastern parts of the province. In the more southern parts of the province, the season is longer and fall frosts are often delayed a month or more after they have destroyed the corn of the East and North. In those parts of the province corn for ensilage purposes is grown in larger quantities each year and should be increased at a much faster rate.

Last summer a farmer in the vicinity of the Agricultural College grew White Cap Yellow Dent from seed which he secured from J O. Duke, of Ruthven, Ont., and we were quite surprised to see a little larger growth and more maturity than in the flint varieties which were grown on the College Farm. It is our intention to grow some of this variety next year.

For several years, we have made the attempt to grow our own seed corn and so aim to breed up an acclimated variety. Unfortunately frosts have regularly interfered with the progress of this work.

Recognizing the uncertainty of the corn crop for ensilage purposes, we grew last year on the College Farm some five acres of peas, oats and vetches, which was cut and put into the silo. This crop yielded at the rate of about 11 tons per acre and contained when put into the silo 23.2 per cent of dry matter, in comparison with 13 per cent of dry matter in an adjoining field of corn, which yielded at the rate of about 8 tons per acre. The labour expended upon this crop was less than half that spent on the corn and the ensilage produced is now being fed most satisfactorily. At the present time we are of the opinion that this crop will prove possibly the most valuable ensilage crop which can be grown in the eastern and northern parts of the province of Nova Scotia.

The complete analysis of the silage from the oats, peas and vetch, and from the corn is given below:—

ANALYSIS OF SILAGE.

	Oat, Pea and Vetch Silage.	Corn Silage.
Water..........	71.85	80.00
Protein.........	2.31	2.37
Carbo-hydrates.	23.42	15.33
Fat............	.83	.88
Ash............	1.59	1.42
	100.00	100.00

It will be seen from this analysis that the oat, pea and vetch silage contains 26.56 per cent of total nutrients, while the corn silage only contains 18.58 per cent. The yield of dry matter per acre was 6,193 pounds on the oats, peas, and vetch, and 3,200 pounds in the corn silage. It is true that this was a poor corn year but it shows the condition in this section about three years out of four.

The protein in the oats and peas

is not any higher than in the corn. which is surprising at the first glance. It will be noted, however, that the corn was very green and evidently contained more nitrogen than would be the case for mature corn. This would be partly amide nitrogen and not as valuable as that in the mature crop. The protein in mature corn silage is about 1.4 per cent. It would seem, therefore, that the oats and peas are more valuable for this section than corn.

It is very discouraging to see corn cut back by frost in August, as happened in the summer of 1913. In 1914 the frost did not come too early, but the season was so cold during May and June the corn did not grow fast enough. In fact the nights were too cool all summer for growing corn. The land was not ready for seed and the corn not planted until June 3rd. Frost did no damage until September 7th, and the corn was not harvested until October 7th and 8th. Even then very little of it had even commenced to blossom. This may be taken as a fair example of at the least, a third of our seasons.

NEW BRUNSWICK.

BY R. NEWTON, B.S.A., DIRECTOR OF AGRICULTURAL EDUCATION.

ALTHOUGH corn has been grown in New Brunswick since historical times, the varieties in use have been mostly small-growing, early-maturing flints, such as New Brunswick Yellow, Canada Yellow, and Squaw Corn, which are cultivated chiefly for their grain. The introduction of larger growing varieties for fodder is a comparatively recent event, and the probabilities are that fodder corn will never become as popular or widely grown as it is in Quebec and Ontario. Our soil and climate are particularly favourable for root growing, while our seasons, except in certain sections, cannot be depended upon every year to ripen the heavy yielding varieties of corn sufficiently to make first quality ensilage.

CO-OPERATIVE EXPERIMENTS.

In the spring of 1914, the Department of Agriculture began some experimental work, in co-operation with a large number of farmers in every part of the province, with a view to finding out the possibilities for growing fodder corn. Each farmer undertaking the work was supplied with the necessary seed, a sheet of cultural directions, and question blanks for his report. The varieties used were Wisconsin No. 7, Wisconsin No. 12 (Golden Glow), and Longfellow.

Over fifty farmers reported in the fall, and their results taken collectively are quite suggestive. The Wisconsin No. 7, as we had expected, proved too late for our conditions; in no case did the ears pass the milk stage. The Golden Glow, an early dent variety, is more promising, though its ears did not pass the dough stage except in a few cases; its average height was about seven feet. The Longfellow this year did not appear to be noticeably earlier than the Golden Glow, while its average height was about six feet.

The work will be continued in 1915 with Golden Glow, Longfellow, Compton's Early, North Dakota, Quebec Yellow, and various strains of New Brunswick Yellow. It may be that the division of the farmer's corn acreage between a large-growing variety, like Golden Glow, and an early, heavy grain producing variety, like Quebec Yellow, to bring up the quality of the ensilage, will prove a profitable system of fodder production.

Our results this year, however, suggest that fodder corn in New Brunswick will have its greatest use as a green crop for fall feeding, and that, in most localities, as a main fodder crop it will hardly compete successfully with roots.

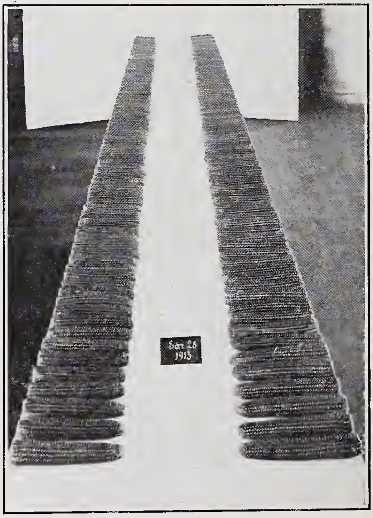
MACDONALD COLLEGE.

BY R. SUMMERBY, B.S.A., LECTURER IN CEREAL HUSBANDRY.

IN the spring of 1907 Prof. L. S. Klinck, then Professor of Cereal Husbandry at Macdonald College, started work with a view to obtaining a variety or strain of corn that could be relied upon to produce a high yield of grain and mature it properly under Quebec conditions. With this in mind a variety called Quebec Yellow, which was originally obtained from Mr. B. E. Reid of Ulverton, Quebec, was chosen as the variety most suitable for breeding and improvement work along these lines. It showed evidences of good breeding, and in preliminary tests had given high yields of grain of good quality.

The system of improvement adopted is one known as the "ear row" system. By this method the value of an ear is judged by its progeny. From each ear one hundred hills are planted; fifty hills to a row in duplicate in different sections of the field, with rows and hills three feet apart. Every fifth row is planted with a composite sample of seed to act as a check. At harvesting time careful notes are taken on these rows with regard to stand, barren stalks, broken stalks, smutted ears, leafiness, maturity, character and yield of ears. On this basis the inferior strains are discarded.

From 1,188 hills of foundation material set out in 1906 twenty-five ears representing as many strains were selected and put into the ear row test in 1907. Since then the best strains have been represented each year by thirty-two ears in the "ear row" tests. Sixteen of the original twenty-five strains were discarded in 1907 and five more in 1908, leaving only four strains named, Nos. 23, 25, 28 and 29, on trial. At the end of 1912, strain 28 had outyielded the others by from one to four bushels per acre, giving 85.13 bushels per acre as an average for four years in the test as compared with 84.09, 81.49, and 81.39 bushels for strains Nos. 23, 25 and 29 respectively. Strains Nos. 25 and 29 have been discarded, leaving only the highest yielding strains Nos. 23 and 28.



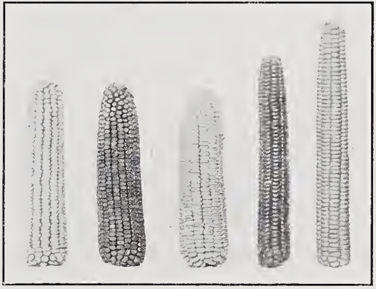
A UNIFORM SELECTION OF QUEBEC NO. 28 CORN.

This corn is of the 1913 crop and is selected for distribution throughout the province.

The inferior strains have thus been eliminated and the very best ones isolated as soon as possible without running a risk of too close inbreeding. Strain 28 is considered to be the best of the two remaining ones and has continued to produce well. It matures early and in 1914, in spite of extraordinary trying conditions, yielded 52.5 bushels per acre in a field block. A few bushels of this corn has been sent out to growers through the Canadian Seed Growers' Association and has been registered as Quebec No. 28. A considerable quantity will also be available for sending out for 1915 planting.

VARIETIES OF CORN FOR ENSILAGE IN QUEBEC.

On account of the shortness of the growing season and the frequent occurence of early fall frosts Quebec requires a corn that reaches the glazing stage on or before the fifteenth of September. Growers in the past have been inclined to place too much importance on yield, rather than on yield and quality combined, and as a result have been growing the large growing, late maturing varieties such as Red Cob Mastodon and Reids Yellow Dent. These varieties along with late strains of Leaming White Cap Yellow Dent are not suitable for growing in Quebec, in that, although they produce a high yield, they furnish a poor quality of ensilage. Varieties that may be recommended are Early Leaming, Early White Cap, Wisconsin No. 7 and Howie among the dents, and North Dakota, Longfellow and King Phillip among the flints. The Leaming and White Cap varieties have a great deal of range within the variety, some strains being early and some late in maturing. For this reason these varieties do not give uniformly satisfactory results unless special precautions are taken to get an early strain. The other varieties mentioned as being desirable are free from this fault and can be depended upon to give a good yield of corn of good quality every year.



Good Varieties of Ensilage Corn for Quebec.

Left to right: Early White Cap, Early Leaming, Wisconsin No. 7, King Phillip, and North Dakota.

Corn of good quality for ensilage cannot be produced when plants are closer than 8 to 10 inches apart in the row with rows 3 feet apart. Planting in hills 42 inches apart each way with three to five plants per hill is, however, the method of planting recommended in that a good yield of a high quality of ensilage is produced at a minimum cost for cultivation.

ONTARIO.

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE.

IN this province a great deal of attention has been devoted to the corn growing industry. About seven or eight years ago, shortly after a district representative had been appointed for Essex county, he took up the matter of improving the corn industry, which constitutes such an important part of agriculture in that section.

In order to accomplish this, he succeeded in organizing an association known as the Ontario Corn Growers' Association. The benefits of this organization have been very conspicuous and have been along two lines. In the first place it has resulted in a vast improvement in the quality of the corn grown for seed purposes in that section, and in the second place it has resulted in the extension of the use of home grown seed in various other parts of the province. The association holds an annual exhibition, and it is a notable fact that the quality as well as the number of exhibits have grown rapidly from year to year.

Aside from this, two other shows have since been organized, and the original parent organization now only serves the two counties of Essex and Kent. An independent association was organized in Elgin county and holds an exhibition at West Lorne, as certain sections of Elgin are splendidly adapted to the corn growing industry and are producing large quantities of high quality.

Then, too, there has been an organzation formed in Lambton county, and this organization last year held its first show at Petrolia, and is following it up with another show during the present winter. As an indication of the great interest which is taken in corn growing in Lambton county, it may be pointed out that last year the Honourable W. J. Hanna offered a handsome trophy for the best five acre field of corn, and for this trophy there were 165 entries.

All these associations receive grants and other assistance from the Ontario Department of Agriculture.

In connection with the extension of markets for seed corn, exhibits have also been made, especially by Essex and Kent, and to some extent by Lambton, at the Toronto Exhibition and at the Guelph Winter Fair. In this way an effort has been made to get in touch with the ensilage growers in other sections of the province, and there is no doubt but that a large number of farmers are now using home grown seed where they formerly imported seed from across the line. Every effort is being made to keep up the quality, and a few co-operative associations have been organized with this end in view. Prices have ranged from $1.00 to $3.00 per bushel.

STANDARDIZED VARIETIES.

The associations have taken up the matter of standardizing varieties and seven varieties have been adopted as follows:—

DENTS.	FLINTS.
Wisconsin No. 7.	Longfellow.
Golden Glow.	Compton's Early.
Whitecap Yellow Dent.	Salzer's North Dakota.
Bailey.	

These seven varieties it has been felt are best adapted to this province, and every effort is being made to secure as great uniformity as possible.

While considerable progress has been made, it has been felt that there is still a great deal to be done both in standardizing varieties and in securing the highest percentage of germination. In this connection an important line of experiments was begun last year by the Department of Agriculture through the district representatives, who, of course, have taken a great interest in the corn industry and have been very influential in assisting in the marketing of home grown seed and extending the popularity of ensilage. While it is recognized that the seven varieties named are the best for Ontario, it is equally true that certain varieties are more suitable to certain sections of the province than other varieties. Hence, it was decided to have each district representative secure the co-operation of local farmers in setting aside one acre on eight different farms. On each acre the seven varieties will be grown and in this way there will be a splendid opportunity to judge which variety is most suitable to that district by keeping note of the freedom from disease, the development of the ears and the yield. This work was carried out in eight counties last season, and its success has been such as to warrant its adoption in practically all the counties in which there are district representatives. It is proposed to continue the test for three successive years under similar circumstances so that at the end of that time there will be a well established decision in favour of the best varieties.

In addition to this, experimental work is, of course, carried on under Prof. Zavitz on the experimental plots at the Ontario Agricultural College and in connection with the Experimental Union.

As for sweet corn, the Golden Bantam variety has been growing very rapidly in popularity during recent years as the result of tests which have shown it to be the best variety of early eating corn. Stowell's Evergreen is the late variety, but through the distribution of seed to rural school children for contests at their fairs and through the efforts of the district representatives, Golden Bantam has been very generally adopted throughout the province.

That ensilage is growing more and more popular with the farmer as a first class feed is indicated by the increasing number of silos all over the province. Statistics show that in 1913, 388,138 acres were devoted to corn for silo, as compared with an average of 236,230 for the ten year period.

MANITOBA.

BY PROF. S. A. BEDFORD, DEPUTY MINISTER OF AGRICULTURE.

VERY little corn of any kind, except the native Squaw corn, was grown in Manitoba previous to the establishment of the Experimental Farm at Brandon in 1888. Since that time, however, many varieties have been tested for fodder and for grain, and it has been demonstrated convincingly that corn can be grown with great success in this province.

The Experimental Farm at Bran-

FODDER CORN AT THE EXPERIMENTAL FARM, BRANDON, MANITOBA.

This Corn is of the North Dakota Flint Variety.

don and the Manitoba Agricultural College have played a big part in giving corn a Manitoba status and each year sees still further experiments with this important fodder. In addition to these official activities Messrs. Walter James & Sons, of Rosser, Manitoba, and Mr. Gordon McLaren, of Pipestone, Manitoba, have made crosses with varieties, comparison of yields, etc., with husking varieties. They are the only persons who have done this, so far as I know.

FODDER CORN AT THE MANITOBA AGRICULTURAL COLLEGE.
This Corn is of the Longfellow Variety and Grew 10 to 12 Feet High.

FODDER VARIETIES.

We have found from tests that among the most suitable varieties for fodder purposes the *Longfellow* does well at an altitude of 700 feet to 800 feet above sea level. It varies in height between six and ten feet, has abundance of foliage and usually reaches the early milk stage at the

ENSILAGE CORN IN MANITOBA.
This corn was grown for fodder purposes and some of it was 10 feet high.

altitude given.

North-Western Dent is another favourite. While it is somewhat shorter than the first-mentioned variety and has less foliage, it is considerably earlier, usually reaching the late milk stage in the Red River Valley and occasionally ripening. It is also well adapted for the higher altitudes.

ENSILAGE CORN IN MANITOBA.

Photo taken August 25th, 1913, in a seventy-acre field of corn on the Emmert Estate, East Selkirk.

North Dakota Flint is a third variety which is largely grown in this province. Though not quite as tall as the *Longfellow* it has the same abundance of foliage with the advantage of ripening about the same time as the *North-Western Dent* or very little later.

There are a number of other varieties of fodder corn which are grown in Manitoba in small quantities.

HUSKING VARIETIES.

Native or *Squaw Corn*, grown by the Indians prior to the advent of the white man, is said to have been brought in by them from the Mandan tribe living on the Missouri River near the present site of Bismark, North Dakota. The Mandans are known to have traded with the Indians of the north. This corn is from 3 to 5 feet high, has small ears and the grain varies in colour from pure white to very dark purple. It is the earliest variety known here; but while it will ripen every year if sown during May, the yield of grain is small and it is not desirable for table use.

Gehu Yellow Flint is a very promising kind for husking. It is extremely early and is probably a selection from the *Native Squaw*, though it has longer and larger ears and reaches a height of from 5 to 7 feet.

Free Press, another yellow flint, is usually even a little earlier than the *Gehu* and has a very similar appearance.

Quebec or *Canada Yellow* grows ears from 8 to 10 inches long, borne on a stalk from 5 to 7 feet in height. It is somewhat later than the other two, *Gehu* and *Free Press*.

These varieties constitute almost the only husking corn grown in Manitoba, the total area devoted to this purpose being quite small.

SASKATCHEWAN.

BY JOHN BRACKEN, B.S.A., PROFESSOR OF CEREAL HUSBANDRY, COLLEGE OF AGRICULTURE, SASKATOON.

TO secure improved varieties of corn, this department has been testing the commonly recommended sorts in order to find out those best suited for forage or combined grain and forage, and those that promise most in the hands of the breeder for combined grain and forage or for grain alone. In 1911 thirty-two sorts were grown, in 1912 twenty-one, in 1913 thirty-eight, and in 1914 eighteen were tested out in our trial grounds here.

Among other things, these trials have shown:—

(1) That the large late maturing southern sorts, produce the largest yield for forage but the poorest quality, and no grain.

(2) That the short early maturing native, or improved native sorts are the only ones that can be matured sufficiently for seed in Saskatoon, in an average season.

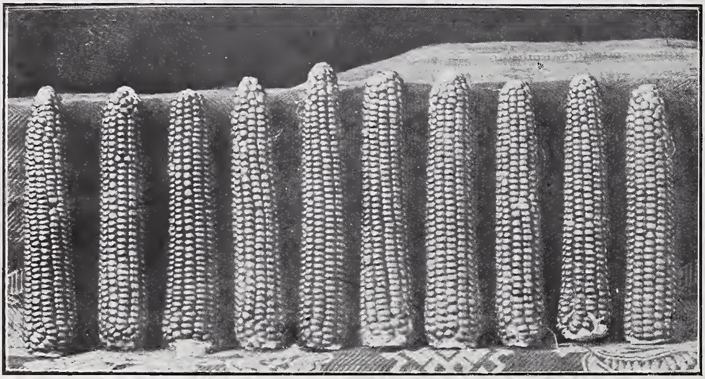
(3) It would seem also, from these tests, that where forage alone is desired the earliest maturing of the taller growing sorts, should be used for the reason that the dry matter content is much greater in the plants that approach maturity than in those that are later, and,

(4) Seeding in rows, providing the land is relatively clean produces larger yields of forage than planting in check rows.

The varieties we have found most suitable for ensilage are those that combine fairly high yield of forage with earliness. Most of these are flint varieties, but some are Early Dents, Longfellow, Compton's Early, Leaming, Quebec Yellow and North Western Dent, are among the best.

None have proven suitable for husking purposes; in fact none except some of the native sorts have matured grain and the yield from these has been so small that we cannot recommend them for grain production. Improved Squaw, Free Press, Dakota White Flint, Gheu, promise to be useful in the warmer parts for grain and forage where hogs and cattle can be used to harvest the crop.

The practice of growing corn and "hogging" it off is one that deserves extensive trial in southern Saskatchewan. The relation of corn to the cropping system is a very pertinent question. This year, on the University farm, the yield of wheat after corn was practically as high as that on fallowed land. The whole subject of corn improvement deserves further study, but it would seem from our experience, that the work should be carried out at some point in the southern part of the province, where there is not so much danger from frost.



EARS OF CORN GROWN UNDER FIELD CONDITIONS BY GEORGE LARKER, TROSSACHS, SASK.

ALBERTA.

BY W. J. ELLIOT, B.S.A., PRINCIPAL, SCHOOL OF AGRICULTURE, OLDS.

UP to the present very little has been done in the way of experimental work with corn in this vicinity, and the general impression is that corn cannot be grown. However, in connection with the school, we tried some 13 varieties of the Squaw and pop corn varieties during the summer of 1914. The corn grew to approximately 4 feet in height and nubbins were being formed, but the cool weather of the fall checked it so that we had no matured corn whatever, nor did we secure corn for table use. In the field varieties the Minnesota 13 and the North Western Dent have been tried. We grew field corn to a height of six feet but without any matured cobs. I am inclined to think that the hot, dry weather during the past summer was rather favourable to corn growing, and we are watching to see what the results of next year's experimental work will be.

BRITISH COLUMBIA.

BY J. C. READEY, B.S.A., SOIL AND CROP INSTRUCTOR.

CORN was grown by the Indians and early settlers in this province at least half a century ago. One of the first distributions of seed corn was made by the Hudson's Bay Company on the South Thompson near Kamloops. Potatoes and corn were the staple crops in this district, and early settlers tell us that the corn was very successfully grown. It might be inferred from this statement that British Columbia was a corn-growing province, but such a conclusion would require considerable qualification. In fact, ten miles from where this corn was grown, in which distance there is an increase in altitude of 2,300 feet, corn-growing is yet in a doubtful stage. It is this variation in altitude, and relation to mountains, that causes the difficulties in successful corn-growing in this province. These difficulties are heavy summer precipitation, or, to state it conversely, limited sunlight, on some of the Islands and coast districts, cool nights in the valleys of the mountainous interior, and late spring and early fall frosts at the higher altitudes. Notwithstanding these difficulties, there is a very large proportion of the arable land of British Columbia that is or will become adapted to the growing of this premier crop. Even in the north country along the line of the Grand Trunk Pacific, the late and early frosts, never very severe, may ultimately disappear with the opening up of the country and corn become a successful crop.

CO-OPERATIVE EXPERIMENTS.

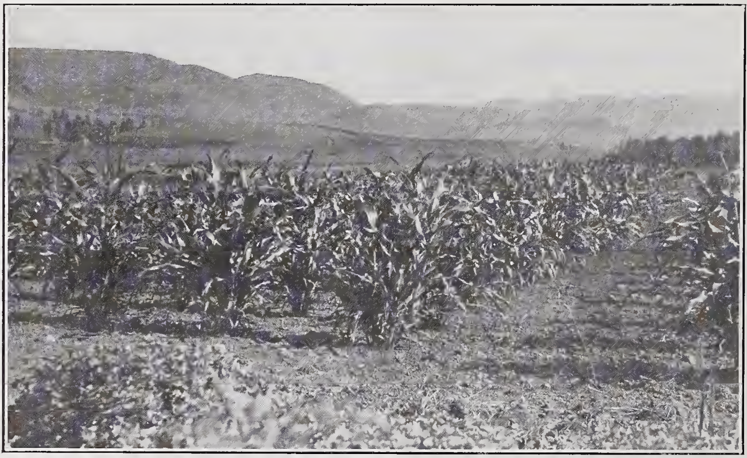
With a view to studying the peculiarities of the various districts with relation to corn growing, the provincial Department of Agriculture undertook to run a series of co-operative tests with corn and alfalfa. Three one-pound packages of corn, representing three distinct varieties, were sent to each co-operator. The varieties used were Minnesota No. 13, Spokane Premium Yellow Dent, White Pride of the North, North Western Dent, and Quebec No. 28. Three hundred and twenty-five tests were made, and reports from one hundred and thirty of these were received by the department. The replies received cover that part of the province south of the

Canadian Pacific Railway and also Vancouver and the Gulf Island. The reports have exceeded the expectation of the department, and indicate that corn may be grown more successfully even than was anticipated, and that districts that were regarded as very doubtful give fair promise. The past season, however, was rather unusually dry and hot; a circumstance in favour of the corn. On the other hand, the Minnesota No. 13, Windus, Spokane Premium White Dent and White Pride of the North were procured from rather low elevations in Washington, U.S.A., the North Western Dent from North Dakota, and the Quebec No. 28 from Macdonald College, Que., so that none of the seed could be said to be acclimated to our conditions, and there is hope that the adaptation of varieties will more than offset the slightest advantage of the past season. Minnesota No. 13, North Western Dent, and Quebec No. 28 have given quite the best results, though the latter variety, owing to the limited amount of seed procurable, did not have wide distribution. The department, however, has grown its own seed of this variety in the province during 1914.

Arrangements are being made for further co-operative tests during 1915 with the three varieties that gave best results last year, and it is expected that the work will be continued until dependable results have been secured.

A most gratifying feature of the work has been the widespread interest that has been created in this most valuable crop. It is felt by the department that corn has been introduced into many districts years before it otherwise would, and that many ranchers will grow the crop who would have concluded that the crop would not "do well with them" had not the test demonstrated the possibilities.

In addition to this co-operative work, the department has leased land for 1915 on which an attempt will be made to produce acclimated seed for 1916. In the meantime, Good Seed Centres will be organized with the local Government Demonstration Plots as the origin of the Elite Seed. In a few years British Columbia will be a corn-growing province, and will be producing her own seed.



QUEBEC NO. 28 CORN, IN BRITISH COLUMBIA, JULY 17TH, 1914.

Twelve ears from this crop won first prize at the International Irrigation Congress held at Calgary.

PRINCE EDWARD ISLAND.

SHORT COURSES.

THE financial aid received through the Dominion "Agricultural Instruction Act" has enabled the Department of Agriculture of Prince Edward Island to carry on short courses in apple packing at several fruit growing centres in the province. They were held at Georgetown, Montague, Vernon River, and Charlottetown. The packing was done in both boxes and barrels. The apples were then marketed, and most of them shipped to Newfoundland. The bulk of the apples were Wealthies. These netted the grower about 70c. a box. The work was in charge of Prof. L. Tennant, and was very popular with those particularly interested.

BOX PACKING OF APPLES.

Instruction Given at Prince Edward Island Long Course in Agriculture, December, 1914.

AT the autumn session of the Long Course in Agriculture held in the Agricultural Hall, Charlottetown, Prince Edward Island, a series of lectures was given on the care, cultivation and management of orchards. The practical work consisted in the grading and packing of apples in boxes and in barrels. They were graded and packed by the students under the supervision of the instructor, and were properly marked and sold, some in Charlottetown and some in Newfoundland.

Barrel-making also formed part of the practical work. There are very few apple barrel coopers in Prince Edward Island, and the fruit growers have had considerable difficulty in securing apple barrels. This course will, however, obviate this difficulty, as several of the students became sufficiently expert to make apple barrels commercially. The course was in charge of Prof. L. Tennant, who was assisted by Mr. A. E. Dewar, President of the Fruit Growers' Association of Prince Edward Island. It was made possible by the aid received from THE AGRICULTURAL INSTRUCTION ACT.

A CLASS IN BARREL MAKING.

Instruction in the making of apple barrels was given at the Prince Edward Island Long Course in Agriculture, December, 1914.

The Short Courses in Household Economics, under the direction of the Women' Institute Division of the Department of Agriculture, Prince Edward Island, commenced January 4th and will continue until March 1st, 1915.

NOVA SCOTIA.

A TURNIP GROWING CONTEST.

A PORTION of the grant received by the province of Nova Scotia in 1914, under the provisions of the Agricultural Instruction Act, was used to defray a portion of the expenses in conducting a contest for farmers' boys in the growing of turnips.

The contest was open to boys between the ages of fifteen and twenty years living in the counties of Colchester, Cumberland and Pictou, N.S., whose guardians' assessed valuation of property does not exceed $3,000.00. The area of turnips to be grown was one acre.

Prizes were given in each county separately. Four prizes of seventy-five, fifty, thirty and twenty dollars were given in each county. The winners were allowed the option for spending the money: (1), In pursuit of an agricultural education; (2), For purchasing improved live stock; (3), For under-draining or otherwise improving his farm; (4), In such other manner as may be agreed upon by the committee in charge of the contest.

The committee consisted of Prof. M. Cumming, Secretary for Agriculture, Charles Hill Onslow and F. L. Fuller, Superintendent of Agricultural Societies, Truro.

In addition to the regular prizes, the provincial Department of Agriculture contributed a prize of $5 each to the boys whose crops were almost equal to the four prize winners. Thirty boys competed, five in Cumberland, ten in Pictou and fifteen in Colchester. The yields of the first prize winners were as follows:

Cumberland..........	1296 bushels.
Colchester............	1266 "
Pictou...............	1245 "

The contest is to be repeated in 1915.

The average yield of field roots over Canada, according to the Canada Year Book, is about 360 bushels per acre.

THE SHORT COURSE.

BY M. CUMMING, B.A., B.S.A., PRINCIPAL NOVA SCOTIA AGRICULTURAL COLLEGE.

THE short course at the Nova Scotia Agricultural College, held from January 5th to 15th, was successful in every respect. The enrolled attendance in the men's short course was 235, and in the ladies' short course 51, making a total of 286. This is the third largest attendance in the history of the institution and the largest attendance ever recorded from the province of Nova Scotia. At the previous short courses there were always in attendance a large number of students, varying from 100 to 200 from the provinces of New Brunswick and Prince Edward Island but, as these provinces are now holding their own short courses, only a very few attended the Truro short course.

The slogan of the course was "Bigger Crops in 1915." A large banner bearing this sign was hung over the assembly hall, where classes met for a part of the time each day, and all the instruction was directed toward this end.

The outstanding feature of the course was the opportunity given to those who attended to take up almost any line of study. Optional instruction was given in as many as four or five subjects at one time. In this way the large classes were in many cases reduced to smaller classes and much more effective work done than could be done by giving instruction continuously to classes too large for the attention of the teacher.

In addition to the usual features of stock judging, seed judging, and lectures in soil cultivation, some of the extra features included were a special course in manures and fertilizers, conducted by B. Leslie Emslie, who is at the present time in Nova Scotia in connection with the farmers' conferences for extra crop production, and a course of instruction in gasoline engines. The various gasoline engine firms sent engines to the college and Mr. Douglas, a gasoline engine expert, conducted the practical instruction classes.

Added features were instruction in special lines of dairying, veterinary science, poultry, horticulture, apiculture, entomology, and in fact almost every subject which is taken up in an agricultural college.

On the evening of the 12th of January, the occasion of the opening of the Women's Institutes, a general meeting was held, which was addressed by the Honourable Mr. Murray, Premier of Nova Scotia, Mrs. Laura Rose Stephen, the Mayor of Truro, Principal Cumming, and others. The attendance at this meeting was considerably over 900, and it was generally considered that perhaps no more inspiring meeting had ever been held in the history of the institution.

Altogether the faculty of the College feel that 1915 has been a banner short course year in the history of the institution and, judging from the large number of orders given for improved grain and turnip seed, following the lectures of T. G. Raynor, of the Department of Agriculture, Ottawa, and Paul A. Boving, of Macdonald College, Quebec, considered that greater crops will certainly be grown in 1915.

WOMEN'S INSTITUTES.

BY JENNIE A. FRASER, SUPERINTENDENT OF WOMEN'S INSTITUTES.

NOVA Scotia is the latest province to take up the work of Women's Institutes.

In July, 1913, the first institute was organized in Nova Scotia at Saltsprings in Pictou County. That institute, with seven others organized during the same month, formed the nucleus of the movement until October, 1913, when six more were formed.

The first convention was held in Truro in January, 1914. That was a memorable series of meetings, marked by splendid addresses by Mrs. Laura Rose Stephen of Huntingdon, Que., Dr. Soloan of the Normal College, Truro, Principal Cumming of the Agricultural College and Dr. S. J. Walker of Truro. It was held during the annual short course and thirty delegates attended. Besides the convention meetings they were able to take in several of the short course lectures and demonstrations in domestic science and home nursing.

During 1914, twenty-two institutes were organized, making a total of thirty-six and these institutes are distributed through the various counties as follows:—Pictou, three; Colchester, two; Cumberland, four; Hants, two; Kings, five; Annapolis, two; Yarmouth, two; Queens, three; Lunenburg, five; Antigonish, five; and Guysboro, three; leaving Halifax and Shelburne counties and Cape Breton Island still unorganized, not for lack of invitation or inclination, but for lack of time.

It has been thought wiser in putting this movement on a working basis in Nova Scotia to have a few institutes organized in each county rather than have two or three counties thoroughly covered. That has been the method adopted so far and it has proven eminently successful and satisfactory.

The second annual convention was held in January, 1915, during the second week of the annual short course. The first convention outranked the second one. In 1916 with our new building, there will be no clashing of short course lectures and convention sessions. The addresses at this convention sustained the high standard set at the first convention and were delivered by Honourable J. A. Murray, Premier of Nova Scotia; Mrs. John Stanfield, Truro; Mrs. Laura Rose Stephen, Huntingdon, Que.; Mrs. F. Sexton, Halifax, Principal Cumming; Mr. L. A. De Wolfe and Rev. W. P. Grant, Truro.

There were fifty-one delegates present and about seven visiting members. The reports from the institutes were highly gratifying and the amount of work accomplished for the Red Cross, Belgian Relief and Patriotic Fund both in practical work and in gifts of money was astonishing. Besides their splendid response to these appeals, the institutes have not neglected the calls for aid in their own community. The membership runs between the minimum of fourteen and the maximum of fifty and the majority of institutes runs closer to the maximum. That membership is composed of women of the best fibre in our province,—women whose ideals are high and who stand staunchly for them—women whose desire is to better their homes and community and to respond to the call "For Home and Country" at any moment.

Now just a word as to what the Department of Agriculture has done to help the institutes. At the first convention, a resolution was passed requesting the government of Nova Scotia to consider the advisability of building on the grounds of the Agricultural College, a domestic science school and residence for the girls of the province.

In respect to this appeal there is to be devoted to the interests of women's work in the province, the second floor of the new building being constructed on the college grounds. This will give the needed opportunity of developing the short courses and of providing adequate accommodation for future conventions.

As announced in the December number of the AGRICULTURAL GAZETTE, the women's institutes have availed themselves of the travelling library of McGill University of Montreal. McGill University paid the transportation charges. The fee for the use of 25 to 30 books for three months was only about three dollars, which was met by the provincial Department of Agriculture. The twelve institutes that have had the use of these books have found them exceedingly helpful.

A demonstrator and lecturer on domestic science were in the field last summer and their efforts met with so much success that this phase of the work will be greatly developed this year, adding, if possible, demonstrators in other lines of homemaking and housekeeping.

That the future of the institutes in Nova Scotia is a bright one is now an assumed fact and as the membership grows in numbers and strength, its influence for good will be felt from one part of Nova Scotia to the other or as could easily be said in our beautiful sea-girt province, "From the centre all round to the sea."

QUEBEC.

AGRICULTURE IN SCHOOLS.

BY JEAN CHARLES MAGNAN, B.S.A., DISTRICT AGRICULTURIST, ST. CASIMIR, QUE.

SCHOOL GARDENS.

THE school garden movement has made marked progress this year in the province of Quebec. The teachers now realize that agriculture must be taught in rural schools. In one of the districts where the department has a representative (Champlain and Portneuf) there has been a remarkable increase in the number of school gardens. In 1913 there were five schools with gardens in this district; there are now 49, an increase of 44 during the year. This very encouraging result shows that the teaching of agriculture in rural schools, under the direction of the Quebec Department of Agriculture, is keenly appreciated by the people as well as by the teachers of the province. There were, last year, 234 schools with gardens. The number of children working in these gardens was 7,740. In the counties of Portneuf and Champlain, there were in 1914, 49 schools with gardens, operated by 960 children. In the village of St. Casimir de Portneuf, where a movement for the teaching of practical and theoretical agriculture was started at the College of the Christian Brothers, a garden school products' exhibit was held on the 14th of Sept. 1914. Over 300 scholars took part in this event. There were over 175 exhibits of vegetables, 75 of domestic work; 65 chickens; 22 sheaves of Banner oats, hand selected by the pupils; 18 plates of fruit; 20 jars of preserves, paintings and other special exhibits. The fair was attended by over 1,600 people.

The programme included practical demonstrations and sports. At the close of the day the pupils sang the national anthem "O Canada" and shouted "Long live agriculture."

MACDONALD COLLEGE.

THE MILK SUPPLY OF MONTREAL.

BY HARRISON, SAVAGE AND SADLER.

REASON OR PROLOGUE.

THE writers have investigated the city's milk from a bacteriological standpoint.

In the form of a Macdonald College bulletin the writers put forth their conclusions and recommendations, resulting from a comprehensive bacteriological study of the subject. The reasons for undertaking an investigation of the city's milk supply are made clear in the early paragraphs where the following, among other statements, are found:—

"The enormous death rate of infants in Montreal due to intestinal disease is in great measure due to improper methods of feeding and to dirty milk."

"Out of every 100 children born in the city of Montreal 32 die before the end of their first year."

"This appalling infantile mortality is only equalled by that of Chili."

This appalling loss of life and of potential worth in the metropolis of Canada is therefore of grave concern to the community, and the examples quoted show that it may be reduced. For this particular reason and also on account of the well known role that milk plays in the dissemination of typhoid, diphtheria, scarlet fever, tuberculosis, etc., the present investigation was undertaken. The results of these studies are set forth with nothing extenuated nor aught set down in malice.

Through the courtesy of the provincial Board of Health authorities, two of the writers were made milk inspectors *pro tem*, and their labours were rendered much lighter than could have otherwise been the case by the co-operation of the Civic Food Inspection authorities.

A fundamental idea in our method of collecting samples was to have them represent (as far as possible) the milk when removed in the ordinary way from whatever vessel contained it.

The analyses here given show fairly comprehensively the city's milk supply:—

1. As it is produced and shipped.
2. As it arrives in Montreal.

3. During certain processes at wholesale dealers.

4. As retailed.

During the summer of 1913 eleven rural districts supplying the city with milk were visited, and about 250 samples collected from them, while more than 550 were taken in parts of the city.

In the winter of 1913-14 samples were only collected in the city, more than 300 being analysed. These, it should be stated, as in the case of the summer ones, were from street wagons, cafes, bars, restaurants, groceries, hotels of all classes, large dealers, and the many kinds of nondescript places where milk is sold.

LABORATORY METHODS.

From the technical standpoint of a bacteriologist, the methods used in analysing these samples were accurate and complete. All analyses were made in triplicate, the average being expressed as a final result. Not only were total numbers of organisms counted, but by the use of lactose and litmus in both agar and gelatine plates the acid and liquefiying bacteria were differentiated, and as all samples were also plated on æsculin agar the colon content (including manurial contamination) was rated. These nine plates were poured off each sample.

MILK STANDARDS.

For ready reference, all samples taken within the city are graded, the standards with certain modifications of the American Commission on Milk Standards, being used. To the grades A, B, and C of the Commission the writers have added a grade D, which is five times worse than grade C, and contains over five million bacteria per cubic centimeter. Such milk, in their estimation, should not be sold for human food.

GRADING OF MILK.

BACTERIAL COUNT PER CUBIC CENTIMETRE.

Grade	Raw.	Before pasteurizing	After pasteurizing	Colon group		Liquefier group.		Grade.
				Before pasteurizing	After pasteurizing	Before pasteurizing	After pasteurizing	
A.......	under 100,000	200,000	10,000	under 500	0	under 2,000	500	A
B.....	" 1,000,000	1,000,000	50,000	" 5,000	0	" 20,000	5,000	B
C.......	over 1,000,000	1,000,000	50,000	" 10,000	0	" 100,000	50,000	C
D.......	" 5,000,000	5,000,000	100,000	over 10,000	0	over 100,000	100,000	D

Regarding the rural samples, the writers show that most farmers produce grade B or C milk, and that this loses one grade during transportation. They also say "too much emphasis cannot be laid upon the fact that the farmer is given no extra remuneration for the care he may exercise to produce clean milk, although practically all farm produce is paid for according to quality, we find that milk is one exception."

Another factor, which however, cannot be discussed at length here, is the relatively small price that the farmer obtains for milk—the increased cost of labour and cattle feeds has not had its corresponding increase in the price of milk.

The recommendations appended to the report are as follows:—

RECOMMENDATIONS.

In view of our present knowledge of the milk supply of Montreal, we earnestly recommend to those in authority and to the milk-consuming public, that the legal statutes of the province, and the regulations and bylaws of the city of Montreal relative to the sale and distribution of milk be so amended as to include the following points:—

1. The grading of city market milk.

2. Payment for milk according to this grading or scoring.

3. Confiscation of milk as poor in quality as that which we have designated Grade "D."

4. The conferring of such power upon the Chief Food Inspector and his staff as to enable him to—

(*a*) Inspect and maintain at a certain standard all farms shipping milk to Montreal.

(*b*) To issue licenses subject to recall, for the production, handling, sale and delivery of milk consumed in the city to those who satisfy the requirements (and to refuse licenses to others).

(*c*) To fine offenders for violation of regulations.

(*d*) To insist upon the provision of proper equipment in all shops, stores and other places where milk is retailed.

5. The technical examination of men in charge of works where bottling, pasteurization, clarification, cooling, etc., are carried out.

6. The enforcing of pasteurization, i.e., heating milk to a temperature of 145 deg. F. for twenty minutes, followed by subsequent cooling.

7. Frequent visits and tests by the city milk inspectors to enforce proper pasteurization.

8. Systematic publication in the press by the Chief Food Inspector of analyses made of city milk; giving also the names of the vendors from whom samples are taken.

9. The instituting of an educational campaign among consumers; emphasizing the value of milk as a food, the necessity for, and advantages of a pure milk supply, and the duties of the consumer.

10. The general improvements on milk-producing farms, so as to be in keeping with the particulars of our scoring system on page 9.

11. The use of refrigerator or iced cars for transportation.

There are observations on milking machines, the handling of milk by dealers, the conditions under which milk is kept and sold by retailers, transportation, pasteurisation and other notes of interest. At the front of the bulletin is a map of the city showing by means of coloured dots where samples were taken in the summer months.

Copies may be had on application to the Principal, Macdonald College, Que.

SHORT COURSE IN FRUIT GROWING.

A free short course in Fruit Growing and Vegetable Gardening will be held at Macdonald College from February 8th to the 12th inclusive. In this course practical information will be given on fruit growing, vegetable gardening, market gardening and floriculture.

In addition to the staff of the Horticultural Department of the College, lectures will be given by Mr. W. T. Macoun, Dominion Horticulturist.

NOTE.

With a view to preparing teachers in Model Schools and Rural Concentration Schools in the province of Quebec to teach agriculture, an arrangement has been entered into between Macdonald College and the Protestant committee of Quebec, whereby each student of the first year in agriculture who has passed the school leaving examination has the privilege to study for the model diploma during his course in agriculture. This diploma is granted on completion of two years' training. The course is free to Quebec students only. Students from other provinces of Canada are charged seventy-five dollars and from outside the Dominion one hundred dollars. This fee is returnable if the student has proved satisfactorily that he has taught for a school year in the province of Quebec after receiving a diploma.

ONTARIO.

PROFIT COMPETITIONS.

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE.

OVER seventy young men from Ontario farms have just completed a two weeks' course in Stock and Seed Judging at the Ontario Agricultural College without any expense whatever to themselves as a result of the "Acre Profit" and "Feeding Hogs" Competitions carried on by the Ontario Department of Agriculture during the past season. These competitions were open to boys who had taken the six weeks' short course with district representatives, under whom the contests were conducted.

Below is given the list of winners in the "Acre Profit" competition. In the cost, allowance has been made for rent of land at $5 per acre, for cost of fertilizers and cost of labour. In figuring the total value of the acreage yield, potatoes have been figured on a basis of 40c. per bushel, turnips, 10c. per bushel; mangels, 15c. per bushel; oats, 50c. per bushel; peas, $2.00 per bushel; corn for seed, $1.00 per bushel; corn for silage, $2.75 per ton. It will be seen, therefore, that the profits have been figured on a very conservative basis in spite of the fact that many of the winners, because of the superior quality of their product, were able to secure considerably in advance of market prices. The following table shows the winners, cost of production, profit, yield and character of soil and varieties:—

POTATOES.

COUNTY	WINNER	ADDRESS	Cost Prod.	Profit	Yield	
Brant	Shirley C. Davis	Brantford	$23.67	$69.49	239 bus.	Clay loam, following sod, farmed 75 years, 7 loads manure, Paris green; Sir Walter Raleigh.
Bruce	Wm. J. Crawford	Walkerton	$45.03	$120.02	415½ bus.	Sandy loam, following oats, farmed 24 years, 10 loads manure, Paris green; Pearl of Savoy.
Bruce	C. L. Lamb	Walkerton	$44.80	$84.00	325 bus.	Sandy loam, following buckwheat, farmed 50 years, 17 loads manure; Paris green; Pearl of Savoy.
Dufferin	Jas. D. L. Crombie	Mono Mills	$32.80	$96.65	323½ bus.	Clay loam, following pasture, farmed 50 years, 12 loads manure, Paris green; Early Rose.
Dufferin	Russell R. Oliver	Waldemar	$28.49	$87.77	293 bus.	Clay loam, following rape, farmed 15 years, 11 loads manure, Paris green; Delaware.
Durham	Reginald I. Fallis	Millbrook	$36.96	$86.34	312 bus.	Clay loam, following oats, farmed 75 years, 15 loads manure, 200 lb. potash and phosphate; Bordeaux, Carmen No. 1.

COUNTY	WINNER	ADDRESS	Cost Prod.	Profit	Yield
Leeds and Grenville	Hayden H. Hayes	Athens	$38.08	$76.60	288 bus.
			Clay loam, following hay, farmed 30 years, 10 loads manure; Bordeaux, Green Mountain.		
Middlesex	Campbell Lamont	Mt. Bridges	$32.62	$167.18	501 bus.
			Sandy loam, following sod, farmed 60 years, 15 loads manure, seed hill selected for five years, Bordeaux mixture, Paris green and arsenate of lead; Dooley.		
Norfolk	W. G. Johnstone	Vittoria	$27.75	$49.85	208 bus.
			Sandy soil, following clover, farmed 40 years, 10 loads manure; Rural New Yorker.		
Northumberland	Maurice Herrington	Hilton	$46.15	$105.85	385 bus.
			Clay loam, following sod, 12 loads manure, farmed 15 years, Paris green and arsenate of lead; Carmen No. 1.		
Ontario	Chas. E. Broughton	Whitby	$37.82	$64.51	259 bus.
			Sandy loam, following oats, farmed 75 years, 600 lb. Potato Special 2-8-10, Bordeaux and arsenate of lead; Empire State.		
Oxford	Nelson Innes	Bright	$60.82	$70.18	330 bus.
			Clay loam, following pasture, Paris green; Admiral Dewey.		
Rainy River	O. Cameron	Emo	$58.30	$99.70	410 bus.
			Sandy loam, following clover, farmed 4 years, 20 loads manure, Paris green; Delaware.		
Simcoe	Geo. D. Coutts	Midhurst	$37.10	$116.15	403 bus.
			Sandy loam, following wheat, farmed 50 years, 12 loads manure, Paris green; Beauty of Hebron.		
Simcoe	Ira O. Partridge	Barrie	$36.10	$111.10	376 bus.
			Clay, following oats, farmed 40 years, 15 loads manure, Paris green; Clark No. 1.		
Welland	Geo. Moore	Forks Road	$60.33	$62.07	320 bus.
			Clay, following wheat, farmed 50 years, 16 loads manure, 175 lb. 4-6-10 fertilizer, Paris green and Bordeaux; Delaware.		

OATS.

Carleton	Alfred Denison	Pana	$10.93	$30.57	83 bus.
			Clay loam, following corn, farmed 4 years; Banner registered.		
Dundas	Blake Nephew	Finch	$13.67	$27.33	82 bus.
			Clay loam, following pasture, farmed 12 years; O.A.C. 72.		
Dundas	Wm. B. Hamilton	Chesterville	$15.70	$25.30	86 bus.
			Clay soil, following corn, farmed 60 years; O.A.C. 72.		
Frontenac	Russel Shillington	Harrowsmith	$13.08	$16.67	59½ bus.
			Clay loam, following potatoes, farmed 60 years; Banner.		

COUNTY	WINNER	ADDRESS	Cost Prod.	Profit	Yield
Frontenac	J. W. Orr	Glenburnie	$11.75	$12.25	48 bus.
			Sandy loam, following potatoes, farmed 75 years; Banner.		
Haldimand	Lester Strohm	Decewsville	$16.57	$18.43	70 bus.
			Clay, following corn, farmed 60 years; Silver Mine.		
Lanark	Cecil Owens	Kinburn	$10.42	$28.68	76 bus.
			Clay loam, following sod, farmed 50 years; Banner.		
Lanark	H. Smith	Pakenham	$11.20	$25.42	75¼ bus.
			Clay loam, following roots, farmed 90 years; Banner.		
Middlesex	Arthur Pincombe	Strathroy	$12.38	$22.62	70 bus.
			Clay loam, following mangels, farmed 50 years, 18 loads manure; Siberian.		
Muskoka	Alvin A. Goltz	Bardsville	$11.08	$29.92	82 bus.
			Clay loam, following sod, farmed 13 years; Improved Scotch.		
Peel	J. C. Salisbury	Brampton	$13.50	$23.00	73 bus.
			Clay loam, following potatoes, farmed 75 years; O.A.C. 72.		
York	Angus Cowieson	Queensville	$10.30	$28.70	76 bus.
			Clay loam, following mangels, farmed 70 years; Rennie's Earliest.		
York	Raymond Morton	Keswick	$12.23	$22.52	69½ bus.
			Clay loam, following mangels, farmed 75 years, White Wave.		

PEAS.

Thunder Bay	Ross McKenzie	Murillo	$23.50	$53.50	38½ bus.
			Clay loam, following barley, farmed 30 years, 14 loads manure; Canadian Beauty.		

TURNIPS.

Renfrew	Wm. Ryan	Renfrew	$26.80	$74.80	1016 bus.
			Sandy loam, following potatoes, farmed 80 years, 4 loads manure; Rennie's Prize.		
Victoria	G. F. Manning	Woodville	$28.30	$80.70	1090 bus.
			Clay loam, following mangels, farmed 30 years, 13 loads manure; Canadian Gem.		

MANGELS.

Peterborough	Thos. Collyer	Norwood	$30.80	$50.98	681½ bus.
			Clay loam, following peas and oats, farmed 50 years, 11 loads manure; Yellow Leviathan.		

CORN FOR SILAGE.

Grey	Wilford R. Graham	Markdale	$18.03	$39.17	20.75 tons
			Sandy loam, following clover, farmed 50 years, 10 loads manure; White Cap Yellow Dent.		
Manitoulin	Ray Jennings	Barrie Island	$12.40	$55.03	24.50 tons
			Clay loam, following sod, farmed 30 years; White Cap Yellow Dent.		

COUNTY	WINNER	ADDRESS	Cost Prod.	Profit	Yield	
Manitoulin	John Williamson	Mindemoya	$23.95	$28.30	19 tons	Clay loam, following carrots, farmed 12 years, 10 loads manure; Australian White.
Norfolk	Delbert Butler	Simcoe	$18.07	$29.67	17.35 tons	Clay loam, following pasture, farmed 60 years, 8 loads manure, 250 lb. 2-8-10; Leaming.
Oxford	Allistor Innes	Bright	$15.27	$58.76	26.60 tons	Clay loam, following old pasture, farmed 80 years, 6 loads manure; Longfellow.
Prince Edward	Whytock Fox	Bloomfield	$16.81	$40.72	20.80 tons	Sandy loam, following tomatoes, farmed 100 years, 14 loads manure; Wisconsin No. 7.

CORN FOR SEED.

Essex	Tyler Humber	Cottam	$13.70	$81.30	95 bus.	Black loam, following sod, new land; Bailey.
Essex	Forest J. Adams	Arner	$12.55	$77.45	90 bus.	Sandy loam, following clover sod, farmed 50 years; Bailey.
Lennox and Addington	Lee Flynn	Tamworth	$32.45	$73.19	105½ bus.	Clay soil, following clover sod, farmed 95 years, 30 loads manure; Longfellow.
Lennox and Addington	John J. Kearns	Tamworth	$20.90	$44.23	65 bus.	Clay loam, following clover sod, farmed 40 years, 10 loads manure; Longfellow.

THF HOG FEEDING CONTEST.

In the "Feeding Hogs for Profit" competition, conducted by the Ontario Department of Agriculture, the hogs were selected at six weeks of age and a value of $4.00 was placed on them at that age. Contestants were allowed to select four and finish with three. They were fed until 26 weeks of age and a record kept of the amount of food used each week. At the conclusion of the period allowed the hogs were weighed, 15 per cent being deducted for shrinkage, and a value of 8½c. per pound, the then market price, allowed. The prize was awarded by taking into consideration both the profit and the type, 50 per cent being allowed for each, and the bacon hog score card being used for scoring type. The following are the winners:—

COUNTY	WINNER.	Breed	Average Cost Production	Average Value	Average Profit
Brant	C. H. Summerby, Paris.	Yorkshire	$10.83	$14.59	$3.75
Bruce	Thos. G. Smith, Walkerton.	Yorkshire	13.51	17.67	4.16
Carleton	Garnet Howes, Metcalf.	Yorkshire	13.48	20.65	7.17
Essex	Russell O'Neill, Paquette Station.	Duroc	11.51	21.45	9.94
Durham	H. Earle, Ida.	Yorkshire	11.56	20.04	8.48
Frontenac	H. Moreland, Harrowsmith.	Yorkshire & Tamworth cross	15.62	21.50	5.88
Grey	Arthur Atkinson, Rock Mills.	Yorkshire	12.04	23.60	11.56
Haldimand	Elmer Winderken, Cayuga.	Yorkshire & Duroc cross	10.56	18.64	8.08
Lambton	Roy Gouldie, Petrolia.	Yorkshire	15.00	20.18	5.03
Manitoulin	Archie Campbell, Foxey.	Yorkshire	13.04	18.57	5.53
Norfolk	Willie Myerscough, Bealton.	Tamworth & Berkshire cross	12.79	21.62	8.83
Ontario	Lorne Barton, Uxbridge.	Yorkshire	13.39	19.40	6.01
Oxford	Glen Topham, Burgessville.	Chester White	9.38	20.63	11.26
Peel	M. D. Monkman, Brampton.	Yorkshire	11.80	18.41	6.61
Peterboro	Ambrose English, Norwood.	Yorkshire	10.12	16.83	6.71
Rainy River	Percy Locking, Emo.	Yorkshire	13.26	17.76	4.50
Victoria	Austin Reid, Reaboro.	Yorkshire	11.07	14.59	3.52
York	Victor Marchant, Lloydtown.	Yorkshire	9.82	15.90	6.08

These contests have evoked great interest and have undoubtedly had much influence in emphasizing the business side of farming as well as the practical value of modern methods. They have been made possible through the money available under the Federal Agricultural Instruction Act. They will be continued throughout the coming season.

NOTE.

THE Ontario Department of Agriculture during November and December carried on short courses in the judging of live stock at forty-two centres, distributed over twenty-three counties.

The work was largely in the hands of district representatives. The courses included the judging of heavy horses, light horses, beef cattle, dairy cattle, sheep and swine. The courses were from two to three days duration and were well attended.

SASKATCHEWAN.

NOTES.

IN view of the fact that the co-operative marketing of wool in Saskatchewan was such a success last year, the Department of Agriculture at Regina is making preparations to repeat and enlarge the work during the coming season. It is necessary to make a list of all the names and addresses of sheep owners throughout the province, and with this end in view a circular has been addressed to the secretaries of the rural municipalities, asking for names and addresses of sheep owners.

Those who took part in the wool marketing scheme last season obtained from four to eight cents per pound extra for their wool.

Mr Hunter, of the Live Stock Branch, has just returned from an extended trip through the province made to inspect the cattle sold to the farmers under the department's distribution scheme. He reports that the cattle have gone into the winter in good condition, and that the farmers generally are well satisfied with the quality of the cattle purchased for them. Much interest is being shown and many letters are being received by the Live Stock Branch inquiring as to the department's plans for the distribution of cattle and other live stock in 1915. As far as can be foretold at present this work will be undertaken on fully as large a scale as in 1914. The notes given in settlement for stock purchased in 1913 and 1914 are on the whole being met satisfactorily.

The Department of Agriculture of Saskatchewan on January 15th commenced a series of dairy meetings in connection with which there was used a demonstration car. Their program provided for meetings at thirty-nine places, the series to be completed on February 17th. The co-operation of the College of Agriculture and of the Canadian Pacific Railway Company was secured and a first-class passenger coach was fitted up under the direction of the Dairy Commissioner for inspection purposes. The work included addresses covering general dairy topics with particular reference to the improvement and management of a dairy herd. Lantern views were used in connection with the addresses.

Within the last five or ten years the colleges of agriculture have, by extension work, been able to attack the problem of rural life in a new way. This extension work includes such efforts as local agricultural surveys, demonstrations on farms, nature study, and other work in schools, boys' and girls' clubs of many kinds, crop organizations, redirection of rural societies, reading clubs, library extension, lectures, travelling schools, farmers' institutes, inspection of herds, barns, crops, orchards, and farms, publications of many kinds, and similar educational effort directly in the field.—*Report of the United States Country Life Commission.*

PART III.

Provincial Departments of Education.

INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL DEPARTMENTS OF EDUCATION.

ELEMENTARY AGRICULTURAL INSTRUCTION.

PRINCE EDWARD ISLAND.

BY R. H. CAMPBELL, SUPERINTENDENT OF EDUCATION.

FOR many years past Prince Edward Island, like most of the other provinces of Canada, has had agriculture and botany on its school and college courses of study and fairly good work was done in these as in other subjects. But as taught and learned they lacked interest and force. They were taught and studied chiefly because a certain knowledge of them was required for matriculation examination and for teachers' licenses. They were generally regarded as something extraneous to the ordinary school work rather than as a vital and necessary part of it. Confined as they were to the highest classes in the schools these studies did not affect the great majority of the pupils nor influence appreciably their mental outlook nor serve in any sense for vocational guidance.

In the summer of 1913 the first attempt was made to broaden and deepen the course in elementary agriculture and nature study in the schools of the province. The Honourable the Commissioner of Agriculture became convinced that a part of the Dominion grant provided under THE AGRICULTURAL INSTRUCTION ACT might very profitably be spent in giving our teachers a wider educational outlook and a deeper sense of the value of "Rural Science" as a means of training the pupils for intelligent and useful citizenship in an agricultural community. Consequently a "Short Course" for teachers was held for two weeks in the summer of 1913. The best instructors procurable were obtained and some 260 teachers studied assiduously and with results very plainly discernible in improved work in the rural schools during the following school year.

But that did not go far enough. Up to this time only adults or at any rate persons beyond school age were considered in the expenditure of the Dominion grant for the promotion of agricultural education. It began to be perceived, however, that the public schools formed an admirable agency for the profitable expenditure of part of that grant, that in fact there was no way in which a comparatively small expenditure of money could be made to produce such important results as by the judicious encouragement of "Rural Science" study in the public schools. Such study by interesting the pupils in the things around them and by linking together home work and school work would make the latter worth while for those boys and girls whose schooling was about to terminate, would thus hold them longer in school and could be made to influence powerfully their attitude towards country life.

Shortly after the Agricultural Instruction conference held by the Minister of Agriculture in Ottawa last March and largely as a result of that conference, the government of Prince Edward Island decided to make "Rural Science" an important part of the ordinary school curriculum and to expend thereon a part of THE AGRICULTURAL INSTRUCTION ACT grant. There were difficulties in the way. It was necessary that there should be no conflict of authority between the Department of Agriculture and the Department of Education and that there should be no duplicating of work nor overlapping of activities. These difficulties were overcome by the cordial co-operation of the two departments. Instead of appointing one or more directors or inspectors to supervise the "Rural Science" work as distinct from the ordinary subjects of the course, it was decided to regard the new study not as something extraneous but as an essential and vital part of the ordinary school curriculum, standing on exactly the same footing as the other subjects and to be supervised by the ordinary inspectors who continue to be under the control and direction of the Superintendent of Education. In order that this work of supervision should be well done, the number of inspectors was increased from five to ten and the Department of Agriculture provided a special six weeks' course for all inspectors to fit them more thoroughly for their duties. The ten inspectors are nearly all practical farmers as well as practical educationists and are very well qualified for their duties. Each inspector has charge of a group of not more than fifty schools, all of which he can reach without travelling very far from home. He is thus able to give very close and careful supervision to his schools and to become a real educational leader in his small inspectorate.

To give a further impetus to "Rural Science" study, the Department of Agriculture provided a second summer school for teachers in July, 1914. It was held in Charlottetown, lasted three weeks and was attended by about two-thirds of all the teachers in the province. For the guidance of these teachers a well thought out course in nature study was drawn up by educational and agricultural experts; and as an encouragement to put forth their best efforts teachers were given an opportunity to win a substantial bonus by doing well the work of the "Rural Science" course. To be entitled to this bonus a teacher must have a well kept school garden properly used in the instruction of the pupils and have also five "home projects" being conducted in five different homes. Five additional "home projects" are regarded as equivalent to a school garden and the more "home projects" successfully conducted the greater the amount of the bonus.

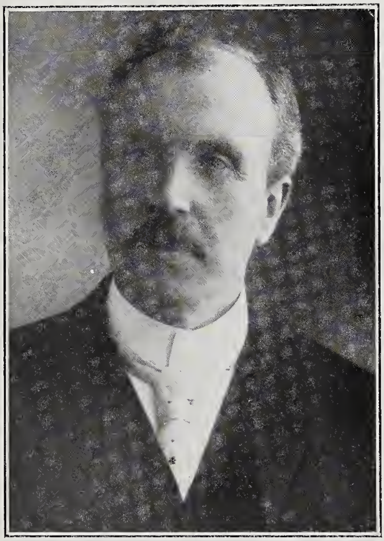
It is perhaps too early to speak of results, but the outlook is certainly encouraging. We feel that we are on the right track and that we are succeeding in making "Rural Science" a vital part of the training of country boys and girls. Already in hundreds of schools children are being taught to observe and to do, to recognize the beauty and significance of common things, to realize the dignity of labour and the joys of country life. They are learning too, to look to their own province, its still undeveloped resources and its splendid opportunities as a fitting field for their future toils and triumphs.

NOVA SCOTIA.

BY A. H. MACKAY, SUPERINTENDENT OF EDUCATION.

HISTORICAL.

AGRICULTURAL Education so far as it has been affiliated with the Education Department in Nova Scotia, may be said to have begun under the late Sir J. W. Dawson who was the first Superintendent of Education—from 1850 to 1855. He not only encouraged attention to this side of education, but made several contributions towards the improvement of agriculture in the province. One of these was published as a text book in Montreal in 1864 under the title "Agriculture for Schools," and was used for many years in Nova Scotia.



A. H. MACKAY, B.A., B.SC., LL.D., F.R.S.C.
Superintendent of Education for Nova Scotia.

From 1855 to 1864 his successor was Rev. Dr. Alexander Forrester, who was also appointed simultaneously to the principalship of the Normal School in Truro. He planned to have a farm in connection with the teachers' training college, had the land bought, and started a monthly paper under the title of the "Journal of Education and Agriculture." Later this publication developed into the "Journal of Education" published ever since by the Department of Education, and the "Journal of Agriculture" published for many years after by the Secretary for Agriculture.

On the introduction of the Free School System in 1864, Theodore Harding Rand became Superintendent. Although he followed the reformers in Europe in laying stress on the English, mathematical and scientific subjects, he allowed the proposed Normal farm lands to be used for other purposes.

In 1884 Dr. David Allison succeeded him. In 1885 the nucleus of the present provincial farm on which the present College of Agriculture has grown up, was bought and the provincial School of Agriculture was established. The Provincial Secretary has always acted as Minister of Education and Agriculture, and so exercised a condominium over the two departments which greatly facilitated their co-operation. Prof. George Lawson of the University of Dalhousie was Secretary for Agriculture from 1864 to 1895, and co-operated with the Superintendent of Education in the erection of the provincial School of Agriculture in 1885, in affiliation with the provincial Normal School. The Normal students took as a portion of their training the science underlying the theory and art of agriculture.

In 1898 the College of Agriculture building was destroyed by fire; but for three years the scientific work was continued in the town of Truro, until the "Science Building" of the Normal College was erected in 1901. The Government also aided a School of Horticulture at Wolfville from 1893 to 1903. The present Superintendent of Education came into office in 1891 and Dr. Lawson was succeeded in the secretaryship of Agriculture by the present incumbent, Melville Cumming, B.A., B.S.A., in 1907.

It was deemed desirable to develop both agricultural and horticultural education as far as possible in affiliation with the teachers' training college. There was a party desirous of having the institution in another good horticultural and agricultural centre of the province. We called in to address the legislature in favour of associating these institutions with the Normal College at Truro, the present Dr. Jas. W. Robertson, C.M.G., whose argument was so effective that even the leaders of the separation movement moved and seconded the vote of thanks to him.

In 1905 the first of the present fine suite of buildings for the Nova Scotia College of Agriculture was erected, and provision was made for the combined work of horticultural and agricultural instruction and research, to some extent in affiliation with the Normal training.

From 1885 to 1904 the School of Agriculture was subordinate to the Normal School, as it was then called. A qualified teacher who obtained its diploma in addition to the regular course, and taught in a school with appropriate equipment, received an extra grant of $100 which later became $30, $60 or $90 per year, according to the character of the school and the work done. About 500 students took partial or full courses from 1885 to 1904; but the number of teachers holding the agricultural diploma and teaching in schools which could qualify for the extra grant was seldom more than a dozen per year.

It was said by some critics that many of these schools were doing no better elementary agricultural work than the more successful ordinary Normal graduates. It was said, and with some truth, that agriculture could not be taught in the elementary school. It was not "agriculture," even when the school garden was utilized as an agricultural laboratory. The general training of the Normal School in which the laboratories and instructors of the School of Agriculture were employed really did develop more or less a scientific and industrial outlook in all the Normal-trained teachers, who for many years up to 1893, were employed only to the extent of about 400 each year. Since that date, this annual quota increased regularly until there are now about 1400 employed annually, filling the half, and the best half of the schools of the province.

In 1904 arrangements were made to utilize the vacation months of July and August for short courses in affiliation with the Normal and Agricultural colleges, in the subjects underlying the intelligent development of agriculture and related industries. Students who previously graduated from the Normal, could thus, without throwing up their schools, continue the course and eventually in one, two or three years qualify for the Agricultural diploma.

In 1908, it was determined to change the pretentious name "Agricultural" into "Rural Science" elementary science forming the foundation of and an introduction to Agriculture. We had already divided "Manual Training" into (1) "Mechanic Science", and (2) "Domestic Science." It readily followed that (3) "Rural Science" might better represent the general scope of our proposed work than the term "agriculture" or "elementary agriculture" especially as "elementary horticulture" might be a closer approximation, and even forestry and arboriculture should be included.

RURAL SCIENCE SCHOOLS.

In 1908 this reorganization came into effect. Teachers employed in their own schools during the year, attended the summer (or vacation) courses in July and August. After qualifying (in one, two or three years) they were awarded Rural Science diplomas entitling them to extra grants according to the character of the school.

These grants were payable in addition to the provincial aid to the teacher. School gardens of the various degrees of efficiency, might, on the Inspector's recommendation, receive aid from the municipal fund for school garden purposes. The regulations framed then form the substantial basis of those in force at present.

The Rural Science Training School (active in July and August) was staffed by the instructors of the Normal and Agricultural Colleges and special instructors from abroad. For the first two years, John Dearness, vice-principal of the Normal School, London, Ontario, acted as Dean, and thus contributed to the forming of the character of the school.

DOMINION AID.

On the intimation of the policy of the Dominion Department of Agriculture to aid elementary agricultural education in each province, it was deemed appropriate to apply the new funds, especially at the start, to some distinctive and specific form of work, while allowing the provincial funds released to be applied in growing amounts to the general development of the schools.

The aid was applied then, to the support of a Director of Rural Science schools, Mr. Loran A. DeWolfe, M.Sc., to the support of the vacation session of the Rural Science Training School in affiliation with the Normal and Agricultural Colleges under the Deanship of Clarence D. Moore, M.A., F.R.S.C., to the partial payment of expenses of the successful students taking the five weeks vacation courses; to the giving of extra grants to qualified teachers in qualified schools, of $15, $25, $50 or $75 per year according to the character of work done; to the giving of aid when necessary to school sections in fitting out school gardens with suggestive samples, or developing "home gardens" or other approved agricultural specialties, under the inspection of the Director who is also aided by the regular school Inspectors who co-operate and mutually report.

During the school year, ended in July last, no less than 63 teachers and schools were qualified for the rural science grant of some grade to the teacher. These schools were distributed through 15 of the 18 counties of the province. Their average salary was $476.35, of which about $329.54 were contributed by the school section, $112.13 by the Provincial Government and $34.68 were apportioned out of the Dominion fund, The total grant from this fund was $2,185 as against $360 paid as the rural science grant to teachers the previous year.

The development in the first year under a Director, has been very marked.

Other schools have also been stimulated by the gifts of seeds, bulbs, flowers, special fertilizers, by circulars of instruction for school and "home" gardens under school supervision, by the formation of clubs, school garden exhibitions, and by gifts of eggs of improved varieties of fowls to be bred by pupils. About $1300 were expended in such work in schools which in the near future will be employing, as soon as they can be procured, teachers with Rural Science diplomas; and for books for the instruction of the teachers. The Secretary for Agriculture is also being continuously consulted and kept in touch with this work.

In all these schools the pupils of the section have to make provision for the establishing of a school garden and its heavy work, and to provide a school library with some books referring to the rural industries possible. The Provincial Government aids this work by giving from $5 to $10 to the teacher for acting as librarian, according as the library is up to the first or second standard, and if the annual report is properly made out, and shows at least the prescribed circulation.

The Provincial Department, of course, provides entirely for the cost of training the teachers in the Normal College from Sept. to June, and even for the payment of their travelling expenses. During the winter the more promising students are being observed and selected for the special rural science courses which become partly differentiated in April. After the close of the Normal at the end of June, these together with Normal trained teachers employed in the public schools, take up the vacation or summer courses which constitute the Rural Science Training School proper, as distinguished from the Normal.

THE TOTAL DOMINION AID TO RURAL SCIENCE.

To enlarge the equipment of the Rural Science Training School originally provided by the province, about one thousand dollars worth of miscroscopes, books and other apparatus were obtained, which will not have to be duplicated in subsequent years. The salaries of the Director, Dean and the eight other paid instructors accounted for about three thousand dollars more. The minimum travelling expenses of, and bonuses to, the 130 students in attendance amounted to $1357.95 an average of about $10 each. The balance, something over four hundred dollars for travelling expenses of the Director, and general expenses, made up the total Dominion aid of $9,315.35 for the school year.

TOTAL PROVINCIAL COST.

The educational work directed exclusively by the Secretary for Agriculture through the regular and short courses in the College of Agriculture, in travelling, demonstration lectures, model orchards, etc., is not included in the following. Nor has the general work of the Education Department bearing on the nature-study cult, nor its cost been referred to.

In the eight grades of the common schools, the elementary principles of Agriculture are strongly emphasized in the prescribed program, which is amply detailed in the authorized teachers' Handbook.

The Normal College gives a very general course of instruction in these subjects to all teachers attending, including also at least a course in Mechanic or Domestic science; and the Inspectors see that the work is being at least seriously attempted in every school.

The Annual cost of the Normal College and inspection is between $40,000 and $50,000. The total cost of the work done under the Education Department (excluding the educational work done under the Secretary for Agriculture and through the College) was $1,565,000. Of this amount $342,000 was expended on the general educational system by the Provincial Government; and $58,000 on the Technical sub-department. The municipalities contributed $165,000 and the school sections $1,000,000. To this should be added the cost of the education work done in the Department of Agriculture, in round numbers $55,000, making the total annual cost of education in Nova Scotia $1,620,000.

Of the $61,243.87 granted to Nova Scotia by the Dominion last year, $9,315.35 was applied by the Rural Science sub-department of Education, and the balance $51,928.52 by the Department of Agriculture.

CURRICULUM OF THE TRAINING SCHOOL.

The following Regulations of the Council of Public Instruction from the Manual of School Law of 1911, briefly indicate the general scope of the extra work to be done by a trained teacher, before obtaining the special diploma:

263. The Syllabus of the Rural Science Diploma Course is presented below. The Daily Time Table will be so arranged that students in attendance may take also the classes in Physical Training and qualify for the Physical Training Certificate. In addition optional classes will be provided in Music and Photography, and it is contemplated that for the benefit of those who may not have attended the Normal College classes in Pedagogy shall be arranged.

264. Rural Science Diploma Course. Courses will be offered in the Principles and Applications of Nature Study, General Biology, Botany, School Gardening and Horticulture, Agriculture, Physics, Soil Physics, Chemistry, Bird and Insect Study, Bacteriology, Geology, and Mechanic Science.

These Courses, one and all, will be free to teachers or intending teachers, and may be taken by:—(a) those who merely wish to extend their knowledge for teaching purposes; (b) those who hold a license of class A. B or C, and wish to proceed to the full qualification required for a Rural Science diploma.

The work is so arranged that it will be possible for almost any teacher to complete the requirements for this Diploma in three summers, or for one already proficient in the subjects to do so in one term.

Under the new regulations, as printed elsewhere, a teacher who satisfactorily completes one term's work and puts the teaching into practice, will be awarded extra grant the following school year. At the beginning of the next season, the faculty will indicate to those in attendance the amount of work which must be covered in order to qualify for this grant.

During the term, six days in the week, Saturday afternoons excepted, will be devoted to class work, field excursions, and individual work in the laboratories.

265. The tests required for the Rural Science diploma will be regular attendance at the class instruction and in the laboratories; a satisfactory report by the instructors on the class, laboratory and field work of the student, and the passing of an examination at the close of the term upon the topics of the following syllabus. In addition candidates will be required:—

(a) To present for examination such collections of natural history specimens, properly prepared, mounted and named, as may be required in connection with any subject of the course.

(b) To submit satisfactory reports on field work or readings in connection with any subject of the course prescribed to be done between terms.

(c) To have demonstrated ability to make practical application in the school room of the principles, etc., inculcated in the course as evidenced by the favourable report of the Inspector on the school conducted for one or more terms by the candidate.

SYLLABUS.

Of the 13 subjects in the syllabus the specifications of only a few as samples will be given in the words of the Manual of 1911:

266. NATURE STUDY. Aims and purposes of Nature Study.

Distinction between Nature Study and information about nature on the one hand and formal science on the other.

Stages in Nature Study lessons:—(1) observation (as active experience). (2) reasoning upon the material observed or actions performed, and (3) expressing the observations, actions, judgments, applications, in the most suitable or by different modes.

How geography (in part), physiology (in large part), arithmetic (in part), may be taught by Nature Study.

The correlations of Nature Study with literature, the expressive arts, arithmetic, mechanic and domestic science, and agriculture.

The preparation of the Teacher: proficiency in heuristic (investigational) as distinguished from informational or memoriter methods of instruction; elementary knowledge of the sciences; knowledge of the use of annuals and books of reference, with a view, not to acquire knowledge to restate to the pupils, but to guide them in their investigations.

The place of Nature Study in the Time Table.

Reference Book:—*Nature Study*, Dearness (Copp, Clark Co.), Toronto.

* * *

272. AGRICULTURE. The types of farming suited to Nova Scotia with a consideration of underlying principles. Comparison

of the methods pursued by farmers in the various parts of the province. Observation of the methods practised at the College Farm.

Field Crops:—The characteristics of the different crops; the methods of successful cultivation of each.

Fertility of the Soil:—Its development and maintenance; the principles of the various tillage operations, drainage, rotation of crops, fertilizers.

Implements and labour-saving machinery.

Animal husbandry:—The economic principles involved; types and breeds of farm animals, including poultry; the necessity of an ideal, and the methods of realizing it; principles of feeding and management. Observational study of the animals of the College Farm.

Reference Books:—*Soils*, Burkett, (Orange Judd Co.) *Types and Breeds of Farm Animals*, Plumb (Ginn & Co.) Other ooks will be recommended.

* * *

270. SOIL PHYRICS. The methods of taking samples of soil.

Mechanical analysis of three typical soils.

Determination of the percentage of air and water in soil.

Temperature of soil, and its modifying factors.

The effects on clay of lime, salt, gypsum and humus.

The relation of size of particles of soil to water-holding power.

The capillarity of at least two kinds of soil, and the rate of percolation through them. Power of air-dry soils to absorb water. Texture of soils—heavy and light.

Soil Solutions.

Reference Books:—*Soils*, Burkett, (Orange Judd Co.) *The Soil*, King, (MacMillan & Co.)

* * *

278. MECHANIC SCIENCE. Brush Drawing:—Materials, their preparation and use. A short course in impression work and brush drawing proper. Applications to nature work in the other courses.

Paper and Card-board Modeling:—The necessary drawing for the development of models. The manipulation of tools and materials. Students to make, at least, ten flat and six solid models and one exercise in book-binding.

Wood-work:—The use of tools. Students to make plant-press, insect box, and spreading board, or equivalent models.

Reference Book:—*The Theory of Educational Sloyd*, Otto Salomon. (Geo. Philip & Son, London, Eng.)

From this sketch it will be seen that the general idea of utilizing the agricultural interests in support of education, and of developing an intelligent interest in agriculture through the elementary schools, originated as early as the time of Dawson, was specially emphasized by Forrester, and after lapsing into desuetude for a season was revived by Allison. From him up to the time of the creation of the Advisory Board of Education in 1907, agriculture was put on the high school course and was imperative as one of the scholarship subjects for those who became teachers. On the recommendation of the Advisory Board "James' Agriculture" and other subjects were thrown out of the high schools for the purpose of simplifying and reducing the high school work. Among other subjects thrown out were book-keeping, physiology and hygiene, and navigation; while the work in other subjects was reduced or made optional.

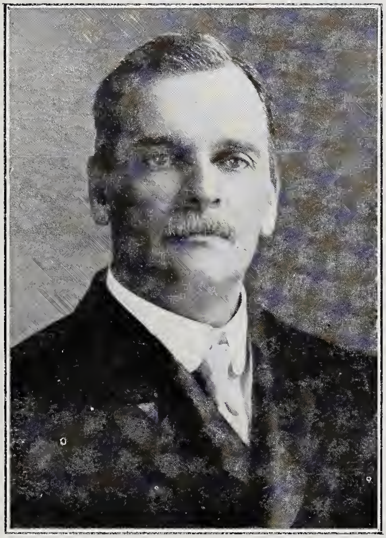
The stimulus given to the cult of elementary Agriculture by the Dominion Grant was therefore received with great delight especially by those who did not appreciate the reactionary movement designed rather to emphasize the study of foreign languages. Those interested in the more general development of the industrial bias in general education were and are still hoping for such a general additional scheme of aid as has been outlined in the "Report of the Royal Commission on Industrial Training and Technical Education."

An educational system based on the accurate study and mastery of the forces of nature and self, combined with an effective mastery of the mother tongue and the history of man, is a great *desideratum* for all. Supplemented by an opportunity for the study of linguistics on the part of those having a taste for them, or likely to find them useful, such a system would probably have no intelligent opponents.

NEW BRUNSWICK.

BY R. P. STEEVES, M.A., DIRECTOR ELEMENTARY AGRICULTURAL EDUCATION.

IN New Brunswick the expenditure for elementary agricultural education is under the control of the Minister of Agriculture. By the provisions of the Schools Act, the officer administering this work, while he is an appointee of the agricultural department, has authority in the public schools carried on by the Board of Education whose executive officer is the Chief Superintendent of Education.



W. S. CARTER, M.A., LL.D.
Chief Superintendent of Education for New Brunswick.

The Board of Education has prescribed a course of instruction in nature study and agriculture for use in all the schools. A monthly apportionment of subjects under the headings, plants, animals, physical nature and environment, has been authorized so as to assist teachers in overtaking the work required by the course of instruction for each grade.

Regulations have been adopted by the Board of Education providing for the qualifications of teachers and the grants to be paid to trustees and teachers.

It is the aim and purpose of both departments to assist in giving to the children of every school district, opportunities for a good rural education, to encourage in the schools a careful study of the resources of the country in general and of local conditions in particular.

It is recognized that the time to make the deepest and most lasting impressions regarding the advantages, possibilities and needs of New Brunswick is during the susceptible period of childhood and youth. Then the physical activities are more naturally the channels through which development of intellect is encouraged.

Outdoor education is therefore being employed as a feature of general school work. Purely book education in relation to subjects of local import, of nature study and agricultural quality, has failed in accomplishment of results in the past. Therefore school gardens, home plots, school ground improvement, school fairs, the study of animals, especially of those of economic value, best adapted for local purposes, are being made units of instruction and presented to pupils in an objective and practical manner. The principle of "learning by doing," of observing matters of environment, suggests the method by which the work is being introduced.

It is also recognized that in order for such work to be made of educational value the teachers in the public schools must themselves be alive to the importance of knowing how best to present it to their pupils. In order to qualify the public school teachers to this end a Summer Rural

Science School has been established at which practical instruction in school gardening, nature study, and the fundamental principles of the natural sciences may be given together with the best methods of awakening interest among the people and of correlating such work in the schools with the other subjects of the school course.

The expenditure for this work during the year to close on March 31st next, will be considerably in excess of that for the year previous. The amount spent for teacher training will be about $2,000. Seventy-five teachers and inspectors attended our Summer School whereas only thirteen were trained the year before. School gardens increased in number from twenty-one to thirty-two in June last. The returns are not yet in for the term just ended. The expenditure for this branch of the service will be about $2,500. For bulletins, official expenses and general maintenance $3,000 will probably be spent, making a possible total expenditure for the fiscal year in the vicinity of $7,500.

During the coming year we plan, therefore:—

1. To continue and enlarge the influence of the Summer Rural Science School for teachers.

2. To extend the regular and systematic instruction of nature study and agriculture in the elementary schools.

3. To promote the extension of the school garden idea as an element in general education.

4. To provide a regular plan of home plot work by children under the supervision of the district school teachers.

5. To organize boys' and girls' clubs in schools for the study of local conditions and practice in properly conducting public meetings.

6. To encourage teachers and schools to keep local records and to develop local business features in the study of arithmetic.

7. To aid in a better observance of Arbor Day and a permanent improvement of school grounds.

8. To establish where advisable school fairs under careful restrictions, the educational feature being emphasized.

NEW BRUNSWICK RURAL SCIENCE SCHOOL.

Pupils of School at Work in Their Garden.

QUEBEC.

BY THE HON. BOUCHER DE LA BRUERE, SUPERINTENDENT OF PUBLIC INSTRUCTION.

THE teaching of agriculture has been not only authorized for years in the schools of Quebec by the Roman Catholic and Protestant committees of the Council of Public Instruction, but has also been a compulsory subject in all rural schools under the general School Law (Art. 3040). The department has also constantly endeavoured to make this effective; but under the conditions which have prevailed not only in Quebec but in the other provinces, and in the states of the American union, until recent years, the teaching of agriculture was very largely perfunctory in its character and had made little impression upon public opinion. For one thing, only an occasional teacher was qualified to put life into the work, or had received the necessary training. Another obstacle has been a prevailing attitude of doubt on the part of the farmer himself as to the practical value of this instruction. In entertaining doubts he was largely justified by the ineffectiveness of much of the agricultural instruction that was offered in the schools.

A great change in public opinion, however, has taken place in recent years. The missionary work of the educational and agricultural authorities of the provinces, and of the Agricultural Department of the Dominion, is at last bearing fruit, and the farmers of Quebec are now vying with those of the other provinces in a desire to recognize the scope, the meaning, the value, and the importance of the application of the results of Science to Agriculture. Consequently, there is now, I am convinced, a very real demand for the teaching of the subject in the rural schools.

To meet this demand both the Roman Catholic and the Protestant committees are taking forward steps, and are supported in their efforts by the government of the province. Already a number of the Catholic inspectors have taken special agricultural courses at Oka for the purpose of qualifying themselves more particularly to supervise this work in the schools under their supervision, and in May next it is expected that the Protestant inspectors of the province will take a special course to the same end at Macdonald College. The Catholic normal schools of the province are also now giving a most complete course in the subject for the rural teachers, the programme of which was published in my annual report to the legislature of two years ago. These teachers-in-training receive the advantage of lectures by specialists, and a steadily increasing number of them are becoming well qualified to do good work in the schools. I have, indeed, been particularly gratified and encouraged by the very remarkable growth of the school garden idea among the Catholic schools of the province. Each year shows an increased number of such schools and of the pupils deriving benefit from them. This in itself is not, of course, direct agricultural teaching, but it is, I think, an almost indispensable means in most cases.

The Protestant committee has taken steps towards the carrying on of a Summer School for the benefit of teachers who have not attended Macdonald College. The courses given will be in Nature Study and Elementary Agriculture. Arrangements are also being made to have lectures given regularly in the rural model schools and academies by the Macdonald College county demonstrators who are stationed in several counties of the province, and who have already been doing excellent work in this connection at some of these schools. By the new arrangements this work would be considerably extended and systematized.

Such in brief outline are some of the features of the new movement which is destined, I believe, to have great results in Quebec education.

ONTARIO.

BY A. H. U. COLQUHOUN, DEPUTY MINISTER OF EDUCATION.

THE place of Agriculture in the courses of study in Ontario primary and secondary schools is at present under consideration by the department with a view to a complete reorganization. The aim of the Minister is to emphasize the importance of the subject; to provide for more systematic teaching by teachers trained for the work in special summer courses, and to enlist the services of the school inspectors of the province by encouraging and inspecting the classes. Pending the announcement of the new programme, a brief outline of what has already been done will suffice.

THE ELEMENTARY SCHOOLS.

With the introduction of Nature Study and School Gardening into the course of study of the elementary schools, about twelve years ago, the Ontario Department of Education paid special grants to the School Boards of country schools to assist them in establishing gardens. In 1908 the payment of special grants was extended to the teachers. In 1911 more emphasis was placed upon the systematic teaching of agriculture in connection with the garden work than had been the case hitherto.

At the commencement, the special training of teachers was arranged for at the Ontario Agricultural College and this has been continued and extended from year to year. The trained teacher is considered to be the prime necessity for the sound establishment of any permanent scheme of agricultural teaching. For a successful ten-weeks' spring course or two summer courses, the department grants the *Elementary Certificate in Agriculture and Horticulture.* Holders of this certificate are allowed the maximum grant but other competent teachers are encouraged also.

In 1912 a Director of Elementary Agricultural Education was appointed. For this position Mr. S. B. McCready, M.A., of the teaching staff of the Ontario Agricultural College was selected. During the past two years the director has been assisted during the summer months by a staff of field agents whose duties were to visit schools, inspect the work, confer with trustees, help the teacher and arouse public interest in the movement. To enlist the sympathy of the whole body of inspectors and to give them an intelligent insight into the scope of the work, the department provided in 1913 a week's short course at Guelph and offered every facility for those who attended.

To widen the interest in it amongst rural teachers a Rural Teachers' Conference, attended by two representative rural teachers from each teachers' association, was held during the first week of August in 1914. Encouragement is given to the work also by the distribution of bulletins, planting material and instruction sheets. Exhibits have also been held at teachers' conventions and fall fairs.

THE SECONDARY SCHOOLS.

During the past two years courses in agriculture have been outlined and carried out in a number of secondary schools. The plan adopted in the case of elementary schools, of having teachers who have taken special training at Guelph, and of paying grants to such teachers and to boards where the prescribed work is satisfactorily done has been applied to high schools.

For two successful Summer Courses at Guelph, teachers are granted the *Intermediate Certificate in Agriculture and Horticulture.* As in the case of the elementary school teachers, those attending the summer courses are allowed their travelling expenses. This puts the teachers in all parts of the province on an equal footing so far as expenses are concerned.

No text-book is prescribed for this work, but each school is expected to provide an adequate supply of standard texts and periodicals. Besides the instruction in the class room, each pupil is required to carry out a *Home Project* which must be supervised by the teacher or some committee acting for him.

At the present time thirteen schools are taking up the work. The subject has been given a value in the examination for teachers' certificates and last summer about one hundred and thirty candidates wrote on the lower school Agriculture paper, and where they took 50 per cent of the marks, were allowed these as a bonus on their totals. Next summer, two of the schools will have candidates writing on middle school Agriculture. Thus the subject is taking its place amongst the recognized high school subjects.

The department arranged with the Universities two years ago for a course leading to the degree of B.Sc. (Agr.) part of the course to be taken while in attendance at the universities of Toronto or Queen's or McMaster and part in attendance at the Ontario Agricultural College. Scholarships are given under certain conditions for the third and fourth years at Guelph. Professional teachers with this degree may teach both science and agriculture in the high schools. When the agricultural departments in high schools are fully developed there is a confident belief that a supply of teachers for them will be available.

These are the salient features of the work already accomplished in agriculture for Ontario schools and the results may fairly be set down as most encouraging.

MANITOBA.

BY R. FLETCHER, DEPUTY MINISTER OF EDUCATION.

IT is not intended in this article to touch upon the work of the Manitoba Agricultural College, chief amongst all the agencies making for agricultural education in the province, with its magnificent buildings and equipment, its large attendance and its efficient staff. The activities of the College are largely under the direction of the Department of Agriculture. This article has to do with the work undertaken and fostered by the Department of Education.

Manitoba is an agricultural province, her people live by the soil. The Department of Education is therefore interested in the dissemination of information regarding the Science of Agriculture. Every teacher trained in the province, before receiving a permanent certificate, is required to spend one month in the Agricultural College with a view to gaining some idea of the rural viewpoint.

A Director of Agriculture and School Gardening was appointed for the province in 1912. He makes arrangements for the supply of seeds, bulbs and trees to the schools. He travels about during spring and summer encouraging the teachers to plant gardens, giving instruction in tree culture and soil preparation and advising on the various problems which arise. In the fall and early winter he is busy with school fairs, of which about 40 were held in the province last year.

HON. G. R. COLDWELL, K.C.
Minister of Education for Manitoba.

Every year the department conducts a Summer School of Science where teachers may take excellent courses in agriculture and gardening under the director's personal supervision.

In addition to this a special grant of $25.00 is made by the department to every teacher who is recommended by the inspector as doing satisfactory work along this line.

Numbers of Boys' and Girls' Clubs have been formed with the co-operation of the Department of Agriculture, and contests in poultry and pig-raising have resulted.

School Boards have been encouraged to establish high school courses in agriculture, and the department pays one-half of the salary of the specialist engaged for this work. Five high schools in the province last year offered these courses, which were fairly well attended.

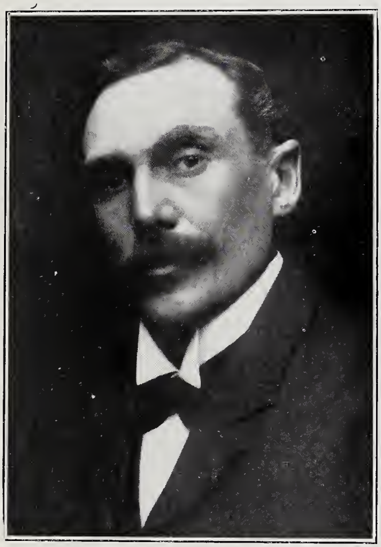
Our appropriation last year for the carrying on of this work amounted to $13,000. As time goes on we may expect this amount to be largely increased.

SASKATCHEWAN.

BY AUGUSTUS BALL, M.A., DEPUTY MINISTER OF EDUCATION.

THE policy of the Department of Education in this province with respect to Agricultural Instruction is in process of development. Saskatchewan, owing to the rapid settlement of the land and the consequent rapid increase in the number of centres requiring educational facilities, has been engaged in grappling with the urgent problem of erecting school districts and operating schools to the exclusion to some extent of the newer movements in education. It is recognised that the most important of these newer movements is efficient agricultural instruction. In the days of the old North-West Territories, Saskatchewan was probably the first of the provinces to have a well defined course in Nature Study as part of the ordinary school curriculum. Nature Study has also always been an important subject in the Normal Schools.

The organization of the ordinary work of the elementary schools and of the secondary schools is now fairly stable and with the policy in agricultural instruction well defined it is not going to be a difficult matter to make such instruction an integral part of the educational system. The design at present is to extend agrcultural instruction of a theoretical and practical nature to the high schools and collegiate institutes and to the larger town schools, the courses established in the same looking forward to practical work on the farms and to higher courses in the College of Agriculture at the University of Saskatchewan; further, to encourage the practice of school gardening, which will be of a voluntary nature for the present, such gardening to elaborate the elementary principles of horticulture and agriculture but mainly to have an educational value in the stimulation of the initiative of the children and the development of their æsthetic faculties. The basic principle underlying this work will be rural life efficiency interpreted as including its material and social aspects. The work will be so devised as to attempt to demonstrate that life on the farm can be made both profitable and pleasant. In addition, instruction in the Normal Schools which will be based on experimental work of an illustrative nature on the grounds, will be so arranged as to train teachers to take up agricultural instruction earnestly in their schools in accordance with the principles already defined.



HON. WALTER SCOTT.
Premier and Minister of Education for Saskatchewan.

This statement of the policy of the department is borne out by the appropriations already made which have received the approval of the Ottawa authorities. Two supervisors of agricultural instruction are to be appointed, one attached to the Normal School at Saskatoon, to carry on the direction of agricultural education in the northern part of the province, the other to the Normal School at Regina, whose work will be concerned with the southern part. In addition to a certain amount of teaching in the Normal School in the direction of demonstrations in school gardening at these points, these supervisors will conduct courses of lectures in the Third Class Normal sessions at different points in the province, will gather teachers together for instruction at other centres and assist in the formulation of courses in agriculture at those points where local authorities desire to establish them and generally will have the direction of various special phases of agricultural instruction throughout the province. Forestry, being a question of very great importance in a prairie country, will have special attention and to this end a bulletin, "Tree Planting for the Schools of Saskatchewan" has already been published and distributed. A book on school gardening is ready for publication.

The appropriation for 1914-15 is as follows:—

Two Supervisors at $1,800.00...	$3,600.00
Travelling expenses, each $750..	1,500.00
One Supervisor in Household Science....................	1,200.00
Travelling expenses............	750.00
Publication of bulletins and circulars....................	1,000.00
Grant to School Garden Associations, 7 at $50.00.........	350.00
Total..............	$8,400.00

The experiments of other provinces and states devised to arrive at a solution of this, the greatest of educational problems, have revealed many lessons and undoubtedly a consideration of these will have a great influence on the adoption in Saskatchewan of a policy of agricultural instruction that should promise success from its inception.

ALBERTA.

BY D. S. MACKENZIE, DEPUTY MINISTER OF EDUCATION.

As a preparation for the more formal study of agriculture the Alberta Course of Studies provides for a graded course of Nature Study, beginning in the lowest grades by the training of the children's powers of observation with respect to the simple every day things about them, and gradually extending to the more complex phenomena of nature as observed in weather conditions and in the growth, characteristics and habits of life of the plants and animals with which they are familiar. The work from the first is carried on in the concrete, and, as the investigation in the realms of animal and plant life proceeds, a foundation is unconsciously laid for the more formal study of the Science of Agriculture, with its practical adaptation to local conditions, as required during the last two years of our public school course.

HON. J. R. BOYLE.
Minister of Education for Alberta.

Considerable difficulty has been experienced in securing for the use of the elementary grades of our schools a text book adapted to the conditions existing in the province, but at the present time a committee has under consideration a book written from the Alberta point of view, which, if found satisfactory, should do much in the direction of agricultural instruction in our public schools. In the meantime special bulletins of information are provided as far as possible to meet the needs in this connection.

The Course of Studies prescribed for the first two years of our secondary or high school grades includes a further study of plant and animal life under the names of Botany and Zoology, together with a course in Physical Science, so that an excellent scientific foundation has been laid for a more thorough course in Scientific Agriculture as prescribed for the third year of the high school course. All candidates for admission to our Normal Schools to train as second class teachers are obliged to cover this advanced course, which includes the formation, physical properties and agricultural classification of soils; the relation of soil to moisture, air and heat; the preparation of the seed bed; germination and plant propagation; bacteria as related to soil; the purity, fertility and selection of seed; pollination and fertilization ; the parts of plants and their uses; foods, fodders and care of farm animals ; the economic values of plants and the independence of plants and animals, together with practical plot work and laboratory experiments and exercises.

The most serious problem confronting the department in connection with its scheme for instruction in Agriculture was the securing of teachers qualified to satisfactorily cover the courses outlined for our schools. This difficulty is being met by making provision for instruction in Nature Study and Agriculture under the direction of the science specialists in our Normal Schools, and also by the organization of Summer Schools for teachers for the purpose of supplementing the teacher's training in this subject as well as in Manual Training, Domestic Science and Art and Physical Training. Sessions have been held during the last two summer vacations and the applicants in each case greatly exceeded the number that could be accommodated. During the summer of 1914, a special course was organized for school inspectors to enable them to more efficiently supervise the work of teachers in the field, and to encourage school boards to introduce and support the work. During the Summer School of 1915, a special course will be provided for those high school teachers who will be responsible for instruction in Science and Agriculture in their respective schools. As a further inducement to both school boards and teachers to give effect to the prescribed courses, provision has been made for government grants for the encouragement of technical education, in which Agriculture and School Gardening is given first place. The schedule is so arranged that not only does the school board that provides the garden, but also the teacher who gives the instruction and supervises the practical work, share in the grant.

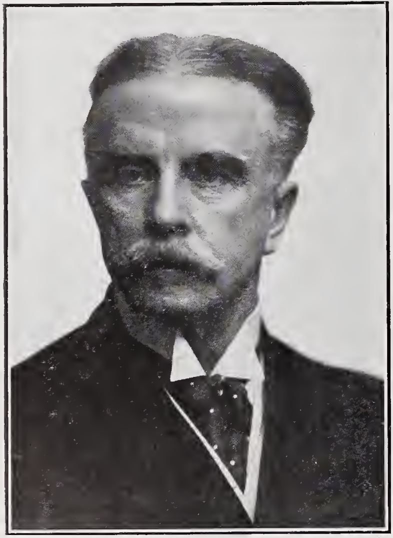
It will thus be seen that an earnest effort is being made to give to Agriculture its proper place in the curriculum, but many are unable to take advantage of these courses owing to the fact that they have been obliged to leave school before even the public school course was completed, or to the fact that they have come to the province from places where such instruction did not form a part of the curriculum. For young men and women of this class noteworthy provision has been made by the Department of Agriculture through the establishment of vocational agricultural schools in connection with demonstration farms at several points in the province. Reports regarding the character of the work done in these schools and the satisfactory manner in which they are meeting the need have already appeared in these pages.

The natural culmination of what has already been attempted along the line of scientific instruction in Agriculture is, of course, the establishment of a Faculty of Agriculture in the Provincial University. Though it is yet premature to make any definite statement in this connection, it is safe to say that the signs of the times are such as to prepare the public for the announcement of another forward step in this direction.

BRITISH COLUMBIA.

BY J. W. GIBSON, M.A., DIRECTOR OF ELEMENTARY EDUCATION.

IN formulating a policy with respect to agricultural instruction the Department of Education for the province of British Columbia aims to conserve and develop not only the rich natural resources of the streams, forests and fertile valleys of the province, but also to develop an intelligent citizenship and a strong, virile manhood worthy of the magnificent heritage with which we have been blessed. We realize that in such a large province, presenting such diversity of physical and climatic conditions on the one hand and of nationalities on the other there are many difficult problems to be solved. It has been said that the solution of all human problems must come through education and we have in this province inaugurated a movement which we hope may help to solve the rural problem in British Columbia. We hope that by getting boys and girls interested in the cultivation of the soil and in the study of the plant and animal life of garden, orchard, and farm before they leave the public school, many of them may become permanently interested and eventually choose rural rather than urban pursuits. Certainly one of our greatest needs in this province is a truly rural population.



HON. HENRY ESSON YOUNG, M.D., LL.D.
Minister of Education for British Columbia.

The studies which we propose in elementary agriculture grow in a natural way out of our prescribed course in nature studies. When these studies are properly presented in the primary and intermediate grades they form a logical basis for the studies in agriculture which should follow in the senior grades. In this way elementary agriculture might be regarded as *applied* nature study. Furthermore emphasis is placed upon the importance of correlating the more formal subjects of instruction, such as, arithmetic, reading, composition, drawing, etc., with these first-hand studies in nature and agriculture. Herein the theoretical finds application in the practical; education then becomes closely related to the life experiences of the child. We believe also that the child should be taught to do things in the best way as well as to understand them. Learning *by* doing is even better than learning *and* doing. For this reason school gardening is being emphasized as an important factor in the method of conducting nature studies and instruction in elementary agriculture. Home-gardening schemes may supplement the school garden work or may be substituted for it where the conditions do not warrant the establishing of a garden at the school. To be effective such home gardens must have some supervision by the teacher.

The older boys and girls are also encouraged to enter in the field crop competitions in their districts which have recently been organized by the Department of Agriculture under the immediate direction of farmers' institutes. This will all tend to the formation of farm and garden clubs which will stimulate interest in agricultural pursuits and at the same time give valuable training in methods of organization.

Already in this province substantial progress has been made both in manual training and domestic science, and as agricultural instruction advances close attention will be given to the correlation of these three kindred subjects. Boys will not only acquire skill in the handling of tools but will also get some valuable training in the planning, draughting and construction of farm and house equipment. The girls will learn how to manage a garden as well as to supervise a home, and to grow good vegetables as well as to cook and serve them.

Following the appointment of a Director of Elementary Agricultural education for the province the department held a summer school in rural science for teachers from all parts of the province. A large number of teachers attended the course and it is hoped that these will return for a second more advanced course. The department fully realizes that the ultimate success of the work depends largely upon the character, ability and preparation of the teachers of the province.

In view of the fact that many boys who have become interested in agricultural studies while in the public schools will wish to continue these studies it is the intention of the department to make agriculture an optional subject in the high schools. It is believed by so doing that it will be possible to relate the work done in agriculture in the public and high schools with the regular courses to be given in the provincial college of agriculture. In certain high schools situated in agricultural districts agricultural specialists will be appointed who will conduct the studies, biology and agriculture, in the high school and will at the same time act as supervisors of school gardening and elementary agriculture in the adjacent public schools. In conclusion the plans and policy of the department of education with respect to agricultural instruction includes the following:—

(1) Thorough preparation of teachers by means of special summer courses in rural science. A first year summer course for which an interim certificate in rural science and school gardening is granted and a second year summer course which when successfully completed will entitle the student to a diploma in rural science and school gardening.

(2) Special grants to teachers holding either the interim certificate or the diploma in rural science and school gardening who carry on the work in their schools.

(3) Special grants to school boards where rural science is successfully carried on.

(4) Improvement of school grounds—draining, grading, planning and ornamental planting and the encouragement of suitable school games is also included.

(5) Assistance in carrying on home gardening schemes under the supervision of the teacher where school gardens are not practicable, or in conjunction with them.

(6) Occasional excursions to observe improved methods in gardening, fruit and grain growing, dairying, live stock and poultry raising, etc., when circumstances will permit.

(7) Elementary agriculture as an optional subject in the high schools. Certain high schools, especially those in agricultural districts, will have on the staff a qualified teacher who is at the same time a specialist in agriculture. Such teacher will be

given charge of the work in botany and animal biology in all classes, and will conduct a course in elementary agriculture for those students who elect to take such a course.

(8) Extension classes in agriculture to be carried on in the high schools for boys or young men who are not regular students in the high school, such classes to be held either during the day or as night classes, or both, as may be found to be of greatest service in the district.

(9) The agricultural teacher in the high school will also have immediate supervision of the work done in rural science and school gardening in the public schools of the district or municipality and, with the approval of the director of elementary agricultural education, will give assistance to the teachers in these neighbouring schools.

(10) The establishing of a provincial schools' nursery for the growing of suitable trees, fruits, ornamental shrubs and herbaceuos perennials for distribution to schools.

The feeling that agriculture must colour the work of rural public schools is beginning to express itself in the interest in nature study, in the introduction of classes in agriculture in high schools and elsewhere, and in the establishment of separate or special schools to teach farm and home subjects. These agencies will help to bring about the complete reconstruction of which we have been speaking. It is especially important that we make the most of the existing public-school system, for it is this very system that should serve the real needs of the people. The real needs of the people are not alone the arts by which they make a living, but the whole range of their customary activities. As the home is the center of our civilization, so the home subjects should be the center of every school.—*Report of the United States Country Life Commission.*

In the list of available publications of the Health of Animals Branch, published in the December number of THE AGRICULTURAL GAZETTE, Bulletin No. 1, Actinobacillosis, by Charles H. Higgins, B.S., D.V.S., Pathologist, was omitted.

On page 37 of the January number of THE AGRICULTURAL GAZETTE the statement "This organization has brought about a remarkable improvement in the quality of the products turned out by the members of the Society, to such an extent that they won 20 prizes out of a total of 24 in Montreal," should read "that they won 20 prizes out of a total of 24 in Toronto." The statement, "The State has been urged, by several witnesses, to take over the management of these associations," should read "The State has been urged, by several witnesses, to supervise these associations."

On page 65 of the January number of THE AGRICULTURAL GAZETTE the sentence, "The maximum Provincial Grant to each Agricultural Society for the three crops totals $150, on condition that the society supplements this with $110, whose expenses are all paid by the Ontario Government", should read "The maximum Provincial Grant to each Agricultural Society for the three crops totals $150 on condition that the Society supplement this with $75. The number of Field Crop judges required this year was 110, whose expenses are all paid by the Ontario Government".

PART IV.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

THE ONTARIO CORN GROWERS' ASSOCIATION.

BY J. W. NOBLE, B.S.A., DISTRICT REPRESENTATIVE, ESSEX, ONT.

FROM February 9-12, 1915, the seventh annual Ontario Corn Exhibition will be held at Chatham. At this exhibition will be presented a fair representation of the corn grown by over one thousand farmers in the corn growing belt of southwestern Ontario who are members of the association. In February, 1909, the initial show of the association was held and since that time the quality as well as the quantity has improved each year. The seed corn belt of Ontario includes the counties of Essex, Kent and Lambton with parts of Middlesex, Elgin and Norfolk.

"Better Corn and More of it" is the motto of this strong organization, the object being to improve the quality of the seed corn supplied to the growers of ensilage corn, at the same time increasing the amount of seed grain grown per acre.

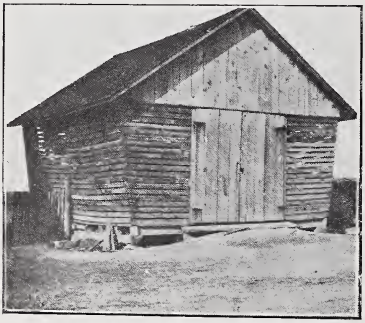
EXPERIMENTAL WORK.

In the spring of 1914, upon the recommendation of the corn growers, the Ontario Department of Agriculture commenced a series of experiments in the different counties of Ontario. Through the agency of the county representatives the provincial department will test the seven varieties standardized, under the same conditions, to ascertain the most profitable varieties for the different zones of Ontario. These varieties will be compared with a view to yield, date of maturity, and suitability to the soil of the different sections. Each representative will be supplied with sufficient material to plant seven acres of corn, and reports upon the results will be collected and compiled.

As germination determines to a great extent the value of seed corn the members of the association are conducting experiments in different methods of drying corn after it is husked and gathered from the field. The former method of drying corn in a broad low crib has not been very satisfactory as climatic conditions are found to injure the germinating power. Rack drying and peg drying are being carried on with the best results. The underlying principle of these systems is to allow the air to circulate around every cob so as to thoroughly dry each kernel. This drying eliminates the subsequent danger of being injured by frost. Experiments upon the effect of shipping corn under different conditions are also being arranged.

IMPROVEMENT BY SELECTION AND BREEDING.

Corn breeding is receiving its due consideration in this improvement campaign. The seed growers through patient and careful selection are improving the quality of the corn produced each year. Various methods are used to accomplish this aim, but the seed plot method seems at present to be the most popular. A great many growers are conducting the system of ear-to-the-row selection. The best ears from the crop are saved and each ear is planted in a separate row. This plot is cultivated in the best possible manner and at the time when the first silk appears the tassels are broken from any stalks that do not show a large ear being produced. In this way the unproductive tendencies of these stalks are eliminated. By selecting the best ears from the most productive rows of this plot for planting the following year, the yield is considerably increased.



A CORN DRYING CRIB.

This is the type of corn crib most prevalent in the corn growing sections in southwestern Ontario. Germination tests from these houses are not always satisfactory.

Still another method of improving the quality of the seed has recently been evolved which goes even a step farther than the requirements of the Canadian Seed Growers' Association and is a development of the same method as the one required by them. It is the ear-to-the-row test, preserving one-half the ear to be sown or discarded the following season. The ears are numbered, one-half of each ear is shelled, kept separate and planted in a row by itself, the rows being numbered to correspond to the numbering of the ears. The results of each row are ascertained and the half ears which did not produce a good yield of standard ears are discarded. In the following year only the ears which gave the best results are planted in the seed plot, which means that the rows all produce well, and consequently the seed produced is greatly improved, for the high yielding corn is cross fertilized with high yielding corn only, which removes one of the handicaps which has for so many years impeded the progress in increasing yields and in seed improvement.

At the annual convention in connection with the exhibition prominent scientists will deliver addresses upon recent investigations regarding the best methods of cultivation, harvesting, curing and breeding corn. Experiments will be discussed and object lessons drawn from the results. An annual report of the convention contains the reports of convention meetings, and other items of interest to corn growers.

The work of the Ontario Corn Growers' Association may be said to be in its infancy; still a great deal of good is being accomplished which is already yielding its influence upon the corn growing industry of the province.

DIVISIONS OF EXHIBITION.

The exhibition this year is divided into a senior and junior department, and contains also county, township, and semi-provincial classes, as well as a seed and vegetable department. The senior department is open to all who have paid their membership fees. Exhibitors in the junior classes are confined to boys and girls 16 years of age or under.

The following are the standards of varieties adopted by the association:—

DENTS.

WISCONSIN NO. 7.

Ear—Length, 8½ inches to 9½ inches, Circumference, 7 inches to 7½ inches.

Kernel—Colour, creamy white. Indentation, well dented. Rows, 16—18.

Butt—Moderately rounded.

Tip—Well covered. Fairly full.

Cob—Colour, glistening white.

BAILEY.

Ear—Length, 7¾ inches to 8½ inches. Circumference, 6¾ inches to 7¼ inches.

Kernel—Colour, yellow cap with reddish tinge lower. Indentation, nicely dented.

Rows—16—18.

Butt—Moderately rounded.

Tip—Full. Well covered.

Cob—Colour, dark red.

WHITE CAP YELLOW DENT.

Ear—Length, 7¾ inches to 8½ inches. Circumference, 6 3/8 inches to 6⅞ inches.

Kernel—Colour, cap white, remainder yellow. Indentation, fairly rough.

Rows—14—16.

Butt—Moderately rounded.

Tip—Well covered, slightly tapering.

Cob—Colour, red or white.

GOLDEN GLOW.

Ear—Length, 8¼ inches to 9¼ inches. Circumference, 6½ inches to 7 inches.

Kernel—Colour, deep yellow. Indentation, medium.

Rows—14—16.

Butt—Moderately rounded.

Tip—Slightly tapering.

Cob—Colour, cherry red.

FLINTS.

LONGFELLOW.

Ear—Length, 10½ inches to 11½ inches. Circumference, 4½ inches to 5 inches.

Kernel—Colour, deep golden yellow. Indentation, none. Rows, eight.

Butt—No larger than 1/3 distance up ear.

Tip—Slightly tapering and well covered.

Cob—Colour, pure white.

SALZER'S NORTH DAKOTA.

Ear—Length, 11 inches to 12 inches. Circumference, 5 inches to 5½ inches.

Kernel—Colour, pearly white. Indentation, none. Rows, eight.

Butt—No larger than 1/3 distance up ear.

Tip—Slightly tapering and well covered.

Cob—Colour, pure white.

COMPTON'S EARLY.

Ear—Length, 12 inches to 13 inches. Circumference, 5½ inches to 6 inches.

Kernel—Colour, deep golden yellow. Indentation, none. Rows, twelve.

Butt—No larger than 1/3 distance up ear.

Tip—Well covered.

Cob—Colour, pure white.

IMPROVED TYPES OF SEED CORN.

BY L. H. NEWMAN, B.S.A., SEC., CANADIAN SEED GROWERS' ASSOCIATION, OTTAWA.

THE Canadian Seed Growers' Association was organized in 1904 for the purpose of encouraging the production and more general use among Canadian farmers of better seed of the different classes of farm crops. From the beginning the corn crop received due attention and a number of corn growers enlisted as members with a view to taking up systematic work in corn improvement. The need for such work at the inception of this organization was strikingly apparent. In the earlier maturing Flint varieties of corn the situation was not so unsatisfactory, but in the Dent varieties chaos reigned supreme. The number of different so-called varieties and strains grown were legion, and these were all more or less composite in character. As is well known, corn cross-fertilizes readily, with the result that in the average corn field there may be found many different combinations which manifest themselves as different strains. These strains in turn become crossed with each other and the mixture becomes more and more composite until we have a motley mixture of types. This is exactly what happened in the corn fields of Canada and the condition depicted was the condition in which we found the corn situated when the Association came into being a decade ago.

As a result of the above situation in part at least, Canadian grown seed corn was not held in high esteem by the seed dealer. Not only did he find it difficult to obtain from year to year, seed of uniform type and which would behave similarly under given conditions, but he found that the germination was also variable and unreliable. In order to secure seed which was at least of high vitality, he relied chiefly upon the American market, particularly the middle Western States for his supply. Unfortunately however the types of corn grown in those warmer regions mature too late in most parts of Canada to make even good ensilage although they produce a large, luxuriant foliage and high tonnage. The production in Canada, chiefly in the Lake Erie counties, of types of corn suited for ensilage production in the great dairy districts of the more northern and eastern zones has therefore come to be one of the important considerations of the Association. The accomplishing of this task has proven to be slow and arduous, surrounded as it is with many difficulties. It is encouraging to note however that progress is gradually being made although much yet remains to be done. The use of Canadian grown seed corn is becoming more and more general as its superiority becomes known and as the seed growers themselves become better informed as to how to grow and care for the seed produced.

ELITE STOCK SEED.

In the prosecution of its task, the Association has adopted a certain system of seed growing, the first aim being to produce a quantity of seed of a desirable and constant type which will be suitable for propagation for the trade. This class of seed is known as "Elite Stock Seed." In the production of this seed a so-called Hand-selected Seed Plot or breeding plot is employed. This plot ordinarily must be isolated about a quarter of a mile from other varieties in order to prevent its becoming inoculated with foreign pollen. A plot of 20 rows and 500 hills in a row is the size recommended for the average grower. Twenty of the most uniform ears are chosen to plant this plot, each row of which is planted with corn from a single ear. Corn for the following year's seed plot is then chosen from the best rows. This system being a continuous one, a cumulative effect is produced, the less valuable strains being gradually eliminated while those possessing superior qualities are brought together. By means of this system a number of superior and distinctive types have been produced and are now being propagated quite extensively.

SEED CORN CENTRES.

Until recently, each member of the Association working with corn has been required to operate annually a seed plot such as that described in order that he may produce his own Elite Stock Seed. This requirement, while having certain educational advantages, unfortunately has resulted in the multiplication of different types rather than in their diminishment. The reason for this is found in the variability of corn due to the ease with which it crosses, rendering it easy for the breeder to develop or approach the type which he regards as his ideal. As might naturally be expected therefore, we have almost as many types as we have breeders. In so far as this concerns the crops of the breeders themselves, this situation is not a serious one, but for the buying public it is decidedly objectionable, the supply of seed corn of a given type grown under this system being limited and uncertain. What is wanted by those who buy seed corn is a reliable source of supply of certain proven types from year to year. In order to meet this demand the regulations of the Association have been amended so as to permit of the organization of "seed corn centres," that is groups of growers who agree to propagate a given type of Elite Stock seed which has been produced by one of their number under careful supervision and control. By reason of this arrangement the one breeder regulates the type propagated by the other members of the Centre, the latter being simply propagators rather than breeders. This idea is a relatively new one, but bids fair to revolutionize the seed corn business. The first seed corn centre organized is located near Amherstburg, Ont., and is known as the River Front Seed Corn Centre (T. J. Shepley, of Amherstburg is secretary). This Centre is operating with Wisconsin No. 7 corn, the Elite Stock seed being produced by Mr. Shepley and a quantity supplied to each of the members of the Centre each spring at a given price per bushel. This spring (1915) several hundred bushels of high class seed corn of a uniform type are being offered for sale by this centre at a reasonable price per bushel and those who buy this seed and find it suitable for their conditions will find this centre a source of supply of a similar type from year to year. Other corn-centres are also organizing along similar lines and ere long a large quantity of reliable seed of a number of leading and distinct strains will be available.

CORN AS A PREPARATION FOR WHEAT.

In the series of articles on the conservation of soil moisture, that appeared in the November issue of THE AGRICULTURAL GAZETTE, it was brought out by different investigators that in districts of light rain fall a well cultivated corn crop proved a better preparation than a root crop, or even fallow, for wheat the following year.

A number of recognized authorities on soil physics in the following letters shed light on this somewhat puzzling question.

W. H. DAY, B.A., PROFESSOR OF PHYSICS, ONTARIO AGRICULTURAL COLLEGE.

My attention has been called to statements in the November GAZETTE to the value of a corn crop as a preparation for wheat the following year. I have given these matters some thought and so far as I can see Mr. Fairfield, on page 880, has instanced two factors which undoubtedly played a large part in giving the yields which he mentioned at the bottom of page 880, which showed the following:—

	1914		1913	
	bu.	lb.	bu.	lb.
Yield of wheat after turnips	1	3	15	55
Yield of wheat after corn..	22	12	33	20
Yield of wheat after summer fallow.........	15	14	26	55

These two factors are:—

1. Turnips make probably their heaviest draught on the soil moisture late in the season, while the corn uses little, if any, during the latter part of the season.

2. The use of manure at different times on the plots in question. The corn land had manure just previous to the corn crop. The summer fallow had no manure recently, while the turnip land had manure sometime earlier than the corn land.

There is a third factor not mentioned by Mr. Fairfield, which I think must play a part. Corn is a deep-rooting plant and during the year following corn there are a great many root fibres in the soil in a state of partial or complete decay. These fibre channels it seems to me would form very active capillary channels.

Since moisture is the predominating factor in crop production, especially in Western Canada, we would under these circumstances expect that wheat after corn would unquestionably give better results than wheat after turnips, but on the fallow land during the year it was fallowed the loss of soil moisture we should expect to be much less than on the corn land, and it is doubtful if we should expect better results from corn land than from fallowed land, and I am personally doubtful whether, if the manurial treatment were the same, we should get the results given in the table. Of the two factors mentioned as applying to "Corn vs. Fallow Land" I consider that relating to manure greater than the other.

Outside of these three factors I cannot see what else could account for the difference.

Now as to the case of "Corn vs. Wheat" on page 875, I think the difference noted is accounted for by the factors above mentioned.

JOHN BRACKEN, B.S.A., PROFESSOR OF FIELD HUSBANDRY, UNIVERSITY OF SASKATCHEWAN.

For two years in succession we have noticed that crops following corn give very favourable returns as compared with fallow and much larger yields than similar crops sown on fallow or spring plowed stubble. Both last year and this year we had opportunity to observe the effect of corn and turnips preceding wheat and alfalfa. Our observations were similar to those referred to in the November GAZETTE. The yield following corn was much greater than that following turnips and the favourable yields following corn we think are due to four factors:—

1. Corn requires less moisture per lb. of dry matter than any of our other commonly grown crops.

2. In this country the draught of corn upon the soil ends at the time of the first fall frost while in the case of turnips their greatest growth is made after this time.

3. The intertillage given the corn crop develops available plant food and makes the soil solution more dense, thereby requiring less moisture per unit of dry matter produced in the succeeding crop.

4. In northern climates and in short seasons the yield of corn is light and the supply of moisture is therefore not heavily drawn upon.

It should be pointed out however, that the yield of corn last year was very light, the average being about 8 tons green weight per acre. The average yield of wheat on fallowed land this year was 30 bus. 15 lb.; wheat following potatoes yielded 25 bus. 10 lb; wheat following corn in one portion of the field yielded 25 bus. 20 lb., and in another 30 bus. 25 lb.

In future we shall be glad to give more positive data on this question since we have nearly 120 rotations under way. There is no doubt but that where corn can be grown and used to advantage it will lessen the frequency of the fallow.

ALFRED ATKINSON, B.S.A., PROFESSOR OF AGRONOMY, MONTANA AGRICULTURAL COLLEGE.

During the past six years, we have rather carefully looked into the question of intertilled crops as substitutes for dry farm fallow, and have carried on a little work on our own dry stations.

As to the probable reason why the Lethbridge Station was able to get a better crop of wheat after corn than after fallow or turnips, the following findings may be of interest:—

In Memoir No. 1 of the Cornell Station, published by Lyon and Bizzell, in 1913, on "Some Relations of Certain Higher Plants to the Formation of Nitrates in Soils," is reported the results of nitrate determinations with various crops. The data given support the general conclusion which is stated, that, "during the most active growing period of the maize crop, nitrates were frequently higher under maize than in cultivated soil bearing no crop." The authors state that, "this phenomena may be accounted for on the assumption that nitrate formation is stimulated by some processes connected with the active growth and absorbing functions of some higher plants, particularly maize, although there are indications that the maize plant obtains a large part of its nitrogen in some form other than nitrates; the combination of these conditions may account for the very high nitrate content of soil under maize."

Under conditions of light rainfall, the development of available nitrogen in the form of nitrates has a marked influence on the economical use of the moisture supply. Work by Thom at the Washington Station at Pullman, Washington, shows that the available food supply in the soil essentially governs the amount of moisture that will be used in the production of a crop. The denser the plant food solution the less water required to convey the food constituents up to the plant for growth. For the same reason that it takes more skim milk than whole milk to get the required nourishment into a calf, so it requires more water to convey the elements of growth to a crop when the plant food solution is thin than where it is more dense. Active nitrate development is stimulated by corn, and ample nitrates or available nitrogen in the soil is a favourable condition for the succeeding crop.

The relatively small wheat yield after turnips is doubtless due to the higher moisture demand of crops like turnip, and the absence of any nitrate forming effect by this crop. In Bulletin 284 of the

Bureau of Plant Industry of the United States Department of Agriculture, under the title "The Water Requirement of Plants," by Briggs and Shantz (1913), it is shown that rape requires 441 pounds of water for each pound of dry matter; sugar beets 377 pounds of water for a pound of dry matter; and Northwestern Dent Corn (an early western grown variety) requires 368 pounds of water for a pound of dry matter. Turnips are not included in the report, but they are doubtless very similar to a crop like rape. If, now, turnips do not stimulate nitrate growth, as is evidently done in the case of corn, and they require more water for growth and grow later, as is commonly the case, we ought not to expect as good crop growing conditions after turnips as after corn or fallow.

Unpublished data in this department point to the same conclusion as is reached by Lyon and Bizzell in their work at Cornell.

I am much interested in the November issue of the AGRICULTURAL GAZETTE. The soil moisture discussion and results are very much worth while, and a publication of this sort ought to make a substantial contribution to better agriculture in Canada.

CONFERENCE ON RURAL LIFE AND WORK.

THE Conference on Rural Life and Work conducted at the Ontario Agricultural College January 29 to 31, 1915, is the beginning of an organized movement to face the Rural Problem honestly and squarely in the province of Ontario. The convention was promoted by the Young Men's Christian Association of the College for the purpose of drawing from the practical experience of those present the advantages and disadvantages under which the farmers and their families carry on their vocation, and to formulate plans whereby the present disabilities of the farming community may be ameliorated or removed altogether.

About six hundred persons were present at the main sessions of the conference, including graduates and other ex-students of the College, men and women from different rural sections of the province who are earnestly interested in various phases of the problems discussed, and students at present in attendance at the Agricultural College and Macdonald Institute.

The Honourable James Duff, Minister of Agriculture for the province of Ontario, was present during one session and expressed his hearty approval of the great work with which the conference was attempting to grapple. He touched upon a number of the economic and social difficulties and disadvantages which the average farmer of the present day is compelled to face and trusted that the convention would be productive of much which would tend toward the solution of some of them. He deplored the condition of rural depopulation which has influenced Ontario for many years and gave it as his opinion that the solution of the Rural Problems would not be complete until the rural population were brought to some state of permanency.

Dr. John Brown, Jr., Secretary of Rural Work Department, International Committee of the Y.M.C.A. of New York, explained the work of the Y.M.C.A. in helping country life in the United States. The movement was begun ten years ago. It was recognized that the country problem was an exceptionally peculiar one and demanded different methods entirely from other branches of Y.M.C.A. work. To develop the situation successfully the Field Secretary must be essentially rural-minded and must understand rural problems through experience. A residence and voluntary leadership is then trained to carry on the work permanently and great success has been achieved in following this method. The whole question appears to hinge on the matter of competent leadership.

Y.M.C.A. rural work is not limited to the social, athletic and religious activities of boys and young men, but extends itself to the arousing of community consciousness in social, business and health enterprises, the bringing together of pastors in Ministerial Associations and teachers in teachers' associations, and in bringing all these things together into co-operative effort. In this way the Y.M.C.A. believes that it interprets Christianity for rural communities in practical terms.

Mr. E. C. Drury of Crown Hill, Ont., a graduate of the Ontario Agricultural College of fifteen years ago, whose newspaper articles on various agricultural questions are well known throughout the Dominion delivered an address upon the "Attractions and Repulsions of Farm Life." He outlined in an impressive and convincing manner the real joys of country life and the serious difficulties with which every farmer is confronted. Speaking of the crying need which exists for leadership in all branches of rural life, he stated that this is being partially solved by the return of agricultural students to their country homes, most of whom exert a wonderful influence for the social and economic advancement of their various localities. But the supply of these men is thoroughly inadequate for the task, and some organized effort is necessary to meet the situation. Mr. Drury has conducted certain investigations in the matter of rural education and has found as a result that 50 per cent of country boys have never read a book —surely a deplorable state in rural education. Touching on the labour question, he stated that much of the trouble in this connection is caused by the farmers themselves. All farmers need a superior and skilled service and are willing to pay for only inferior labour. In Mr. Drury's estimation many of the country ills result from the fact that average farming is not a sufficiently paying business.

THE ECONOMIC QUESTION.

The economic question in its relation to rural life was discussed at length by W. C. Good of Brantford and a number of other speakers, and many important points were raised, some of which were:—Rural credits to increase the production of the farm; a readjustment of taxation; the development of co-operation; the adoption of representative legislation; a mortgage system whereby mortgages may be extinguished in a reasonable term of years; bookkeeping and business management on the farm; tariff on agricultural implements, etc., national banks; business instinct of farmers; capital required for farming.

THE LABOUR QUESTION.

This is one of the most vexing problems in rural Ontario. Interesting points mentioned in this connection were:—Three view points of farm labour—that of the farmer, that of the employee, and that of the son; wages are not suficient to secure efficient service; the average farmer cannot keep a man the year round; the ordinary farm hand cannot look forward to an ambition; Canadian versus foreign farm help; accommodation for hired help: married and single hired men.

THE QUESTION OF EDUCATION.

The matter of education for country children has puzzled educational authorities in Ontario for many years. The problem is a big one and called forth a lengthy discussion. The following are some phases of the question which received attention:—What the Ontario Department of Education is now doing for rural education; school gardens and fairs; work of the county representatives; summer courses for rural teachers at the Ontario Agricultural College; rural school attendance; similarity of curricula in urban and rural schools; male and female teachers; teachers' salaries; changing of teachers; social life of teachers; teachers' organizations; trustees' organizations; pupils' organizations; practical demonstrations on best farm practices; report of the Royal Commission on Technical Education.

RELIGIOUS FACTORS IN COUNTRY LIFE.

The discussion brought to the surface many times the evils of sectarianism in the country. The existence of numerous religious sects in rural districts results in many social divisions all of which are weak. Cooperation in the churches, or better still, church union, probably would do much toward solving social problems. Rural pastors, Sunday schools, Young Peoples' Associations, the church and athletics, were some of the main points considered in this phase of the rural problem.

THE PLACE OF WOMAN IN COUNTRY LIFE.

The session devoted to this subject was one of the most interesting of the conference. A paper on "The Advantages of Country Life over City Life from a Country Woman's Standpoint," by Mrs. Brethour of Burford, brought out many of the bright sides of rural life as well as many disadvantages under which the country housekeeper and mother has to labour. The work of the Women's Institute was clearly outlined and commended. The discussion which followed Mrs. Brethour's paper was conducted by a number of young ladies of Macdonald Institute who were born and bred in the country, and who gave instances of their own experience in problems which farm women are compelled to face. The evils of sectarianism; monotony of rural life for the farm girl; the farm water supply; education in domestic science, constituted a number of the main topics considered. The necessity of keeping the farm girl in the country is as pressing as the farm boy problem.

RESOLUTIONS.

The following resolutions were placed before the conference and were adopted after discussion and deliberation:—

RESOLVED, that we record our belief that if the rural problem of Ontario is ever to be solved it must be done by those men and women resident in the rural districts who have been born and brought up in these districts.

RESOLVED, that in the opinion of this conference the taxation on farm industry in the forms of legalized monopolies, high rates of interest and inflated values of urban land areas, are detrimental to that industry and to the country as a whole; that a lowering of the tariff on farm implements and the taxation of land values engage the immediate attention of the governments of Canada; and that practicable systems of farm credit and of general co-operation form part of the program of adult education in rural districts.

RESOLVED, that from the facts brought out during the conference, it is our opinion that the district representative work, promoted by the Ontario Department of Agriculture is of supreme importance and value to the farming communities of Ontario, and that we hereby heartily endorse the steps already taken by the Government in its establishment and recommend its extension throughout the province as far as possible.

RESOLVED, that we recommend to the authorities of the Ontario Agricultural College that instruction in business management and accounting, marketing and farm economics be included in the regular course, and that under the direction of the Department of Rural Economics, an economic survey of the counties of Ontario be instituted.

WHEREAS, the educational standards and the appreciation of education amongst the country people generally are insufficient for the development of the type of citizenship required to meet adequately Ontario's rural needs, and whereas our system of education has hitherto failed to meet those needs, resolved that the time has arrived for the serious consideration of readjustments of the program of studies followed in country schools at present; and that for the education of country boys and girls past public school age, the establishment of Country People's or Township High Schools, possibly in connection with schemes of consolidation, should be carefully considered.

WHEREAS, the needs for agricultural education for the one and a quarter million people residing in the rural communities of Ontario, to be met adequately, would seem to require in time, large forces of instructors or leaders specially trained at the Agricultural College, resolved that the Agricultural College in order to meet this service might well be freed in time from the supposed necessity of training young men as so-called practical farmers, and that this service should be taken over by other Agricultural Schools that might be established in other parts of the province.

WHEREAS, through rural depopulation in Ontario to-day, the attendance of a large number of rural schools has become so small as to make efficient public school education impossible, resolved that this conference is of the opinion that the establishment of consolidated schools would furnish a practical solution to the difficulty, and also would bring a high school education within the reach of every country boy and girl of the province.

RESOLVED, that we, deploring the conditions of overchurching in the rural districts, do hereby endorse the movement for union of the Evangelical Churches and strongly express the opinion that the Church's relation to the solution of the Rural Problem depends upon the consummation of church union now under consideration.

RESOLVED, that in view of the fact that if ever the Rural Church is to take the place of leadership in rural life which she should, a new class of ministers, who definitely choose as their life work the rural ministry, must be secured.

RESOLVED, that we recommend that the theological colleges of Ontario should immediately plan some campaign of laying the claims of the rural ministry before theological students and prospective students, preferably those who have been born and bred in the country and are in other respects fitted to lead in country life.

RESOLVED, that we recommend to the authorities of the Ontario Agricultural College the establishment of a summer school course for rural pastors and religious and social workers.

WHEREAS, there are specific problems peculiar to the young people in rural Canada in the solution of which the Y.M.C.A. and Y.W.C.A. are specially qualified to assume the leadership, resolved that we recommend that the National Councils of these two organizations be urged to organize departments for rural work immediately, and that, where possible, the work of these organizations be promoted simultaneously.

RESOLVED, that we recommend that the committee which promoted this conference be asked (if willing to undertake the task) to call together duly accredited representatives of all the Provincial or Dominion rural organizations, Government Departmental Representatives and representatives of all other organizations (so far as they are known) which are working for rural betterment, for the purpose of considering the feasibility of forming a Federation for Rural Progress in Ontario, that the work of such a federation might be to promote this conference as an annual event and also to promote a Community Efficiency Conference of one week's duration at some time during the summer, to which Rural Life Leaders of all kinds may be invited.

AGRICULTURAL INSTRUCTION FIELD AGENTS.

DURING the past year the Department of Education of Ontario employed five Field Agents in agricultural education. They worked under the direction of Professor S. B. McCready, Director of Elementary Agricultural Education.

The agents were young men who had taught school and were taking the regular course at the Ontario Agricultural College. The work was financed out of appropriations to the province of Ontario under the Agricultural Instruction Act. Professor McCready has supplied the GAZETTE with reports of four Field Agents, from which the following extracts were taken:—

S. E. PERCIVAL—

As your Field Agent for Agricultural Education in the counties of Renfrew, Lanark, Carleton, Russell and Prescott, from which only fifteen schools made application for assistance in qualifying for special grant, my work has been largely one of propaganda. Keeping in mind the advisability of having agricultural instruction introduced as the result of a feeling of need within the section, I have taken advantage of every opportunity of explaining to the people the aims and purposes of Agricultural Education.

Everywhere this information has been well received by teachers, pupils and parents. The old objections—crowded time-table and unqualified teachers— seem to be fast disappearing. Parents and teachers are now coming to recognize the short-cut obtained in all subjects by making instruction real and applying knowledge as soon as acquired. Teachers realize that a long needed change has come into matters educational, that education to fit children for present day life must be business-like and practical; that children must be taught to "find their hands" and apply their thoughts. I have found teachers as a rule ready to prepare to meet these new demands either by taking special courses or by acquiring necessary information in other ways.

Invariably I have found the teacher, pupils and parents in sections where the district representative has already made himself known to the school, easier to approach and more ready to consider the permanent establishment of agricultural instruction than in sections where no agricultural agencies have yet exerted influence on the schools.

In doing propaganda in new schools, I notified the Inspector and the district representative of what time I should be able to be with them to arrange a series of meetings, each including two or more school sections. This matter was made known to the local papers and the meetings were usually well attended, in some cases there being a short additional programme provided by local talent to supplement the business part of the meetings.

In describing the method of inspection followed I do not think that I can do better than tell of a typical day at a typical school. After a drive of about nine miles I arrive at the school, get acquainted with the teachers and pupils and spend the remainder of the forenoon examining the record books, garden plots, grounds, etc. From 1.30 to 2.45 I have a talk with the children, giving suggestions on experiments to perform, keeping records, how to get the folk interested at home. At recess the village doctor and the village preacher visit the school, and, when after recess I have given further suggestions intended to help teacher and pupils and explained how forces outside the school should be utilized in promoting the work of the school, these two senior visitors express their views on agricultural instruction.

After 4 o'clock all engage in a social chat and about 5 the children have tea ready on the lawn. When tea is over we follow the teacher to the ball ground where we enjoy a game of ball, the doctor, the preacher and teacher taking an active part and the children following their lead. About 7 p.m. the parents and young people begin to arrive, and the district representative, arrives also. The evening meeting is well attended and several very instructive and inspiring speeches are delivered, not the least of these being given by one of the oldest men of the section, who has driven in several miles to be present. This was not always the course of procedure, but is typical.

R. H. ABRAHAM—

The district covered comprised the counties of East and West Kent, South and North Essex and West Lambton and West Elgin.

HOW I INSPECTED SCHOOL.

1. Inspected library and noted the agricultural books; examined register, noted the lessons taken up.
2. Set the children a composition to write on the lesson taken up or held oral examinations.
3. Took the children to the garden and made each child explain what they were learning or trying to learn from the garden plots. If they had no definite object in growing plots I tried to impress on the children and the teacher that they must know before planting what they are trying to learn or they would learn little.
4. Taught a lesson on agriculture by taking the children to an orchard, barnyard or wherever it might be and there have the lesson.

In many of the new schools the pupils had no very definite idea of the work. Vegetables, grains and all kinds of produce were planted in the garden. The experimental and demonstration idea was replaced by the idea that a successful garden consisted of good specimens of lettuce, radish and flowers.

In the older schools, where agriculture has been taught the year before and where the school has been visited by the director of elementary agriculture or by the field agent, the children in most part knew the reason they were growing the produce, namely, to find out something regarding the vegetable or grain that they did not know. The lessons in those schools were much better taught this year and the records of children and teacher better kept than last year.

E. L. SMALL—

My territory was the nine southeastern counties, extending east from Hastings along the St. Lawrence. Apart from this territory I worked in Oxford, Haldimand, Welland and Lincoln counties.

The only schools visited were those which were teaching agriculture and those which were anxious to know more concerning the subject; in either case the teacher was notified several days previous, thus enabling her to make the best arrangements with the trustees or people for our visit.

Sixty schools were visited. Fifty of these were teaching agriculture throughout the year and conducting a home or school garden or children's home projects as an aid in the teaching.

The first duty while inspecting schools was to see that regulations governing the teaching of agriculture were understood and carried out; that lessons in agriculture were taught one hour per week throughout the whole year, that teacher's and pupils' records of work were being properly kept and that the lessons taught were of interest to the pupils of that community. An oral test examination was generally given to the pupils, on the work covered, or short essays were written on the various topics studied. In each school I taught an agricultural lesson, using the pupils' interests as a choice of subject and in all cases used concrete material.

Many of the schools just starting the work have not fully grasped the object of the department. To many the teaching of agriculture means a home or school garden, and these as merely a place for plants to grow, instead of being a well planned experiment to be used as a basis for lessons.

The second summer of work shows a much different school, for teachers are anxious to find out the meaning of the work. In the schools which are doing good work, agriculture is co-related with other subjects; the children have become interested and often suggest and bring material for the lessons. Pupils' progress clubs are formed and the people of the section become interested in the appearance of school and yard.

J. E. McLarty—

The district in which I worked was made up of the counties of Halton, Wentworth, Wellington, Waterloo and East Elgin. In these counties I visited the following number of schools: Halton, 6; Wentworth, 9; Wellington, 5; Waterloo, 4; and East Elgin, 18. All of the above schools were entered as qualifying for the special grants as offered by the Department of Education.

In my work the idea was to co-operate as much as possible with the school inspector and the district representative.

In inspecting the work of the school, the teachers' and pupils' records were carefully examined, oral and written tests were given on the work, the garden was visited by all and the pupils asked to explain the experiments which they were carrying out in their respective plots. In nearly all cases I taught a lesson on some topic to illustrate the intention of the department also showing wherein correlation with other subjects could be brought about.

I find that the teachers are a band of willing workers and are very anxious to receive new ideas.

In the schools which have only begun the work this year the work has been mostly along school improvement, levelling grounds, repairing fences, cleaning school, growing flowers, planting trees and conducting a small garden with a few simple experiments, mostly variety tests and elementary work taught in class. Many schools have made marked changes in the appearance of the school and grounds and in cleanliness and order in the school room.

Schools that have been carrying on the work last year are working out more extensive experiments, each pupil having an experiment which is to demonstrate to the section some particular object. Progress Clubs have been formed and club meetings or debates are held at which the pupils tell what they have learned by experimenting or reading or seen done on their own farm. Many of the members become very good speakers and many clubs write to similar clubs in this way effecting an interchange of ideas and results of work undertaken and accomplished.

Besides visiting schools I gave a few lessons at the Model Schools at Sturgeon Falls and Port Arthur. My work in these schools was taken mostly after four o'clock so as not to interfere with school work. I adhered as closely as possible to the subjects outlined by the department to be taught at the model schools.

I also held two short courses for public school pupils. The courses were each of three days duration. At one school 18 pupils attended, and 30 attended at the other. Here I took up practical work, such as judging grain, sheep, dairy and beef cattle, identification of weeds and weed seeds, breeds of poultry, colony houses and chicken houses, chicken feeds, drainage, and diseases of plants, grains, etc. In each case we had the actual material at hand and the pupils enjoyed work which was mostly outdoors.

R. A. Finn—

During the past summer my work was in the counties of Durham, Northumberland, Victoria and Peterboro, and the districts of Haliburton, Muskoka, Nipissing, around North Bay, and Algoma, mostly around Sault Ste. Marie.

When I arrived in each county I notified the people through the local papers that I was in their locality and would be pleased to have meetings, visit schools, interview school boards, etc. I visited each inspector and district representative and through them got in touch with interested men and agricultural societies, women's institutes, etc. A night meeting was held whenever the people desired it, and in one week I held five meetings on five consecutive nights, in which meetings eight schools were represented. This was in the district around Sault Ste. Marie.

In my counties, 19 schools were teaching agriculture under the regulations, several others doing some work in agriculture.

On visiting a school, I first gave a short introductory talk to the pupils telling of some work in other schools; saw the grounds and equipment, tools, etc., and taught some new games. Next I taught a lesson on some practical subject having the material on hand, then looked over the pupils' and teacher's records and set a short oral or written examination on the subject, recorded by the teacher in the back of the register. A report was then written and sent to the department.

GROWING FOOD ON VACANT LOTS.

THE following statement of the work carried on in 1914 on vacant city lots in Regina has been prepared by W. W. Andrews, the Chairman of the Committee:

"Our method of handling the vacant lots is by a committee of which I am chairman. Our secretary finds out from owners if they are reasonably sure that they will not build on their land during the coming season, and if they are willing to let us have the land for our purposes.

"Then we arrange to plough and harrow them. This costs us 90 cents per lot. (It cost us much more at first). We charge $2.50 for the use of lot, plowing and harrowing and we give some flower seeds to be sown in the 10 feet near the street. Some of the lots were very beautiful. We formed a co-operative society among the gardeners and they bought their seeds co-operatively. We carried on a series of lectures and talks on the conditions of success in Western gardening. These were held in the school houses and were the first social centre work in the school houses. These meetings were attended and the discussions were very interesting. We pay our secretary $50 for his trouble.

"We have now 160 lots ready for the spring. We had some city property which is now used by the city for nursery purposes. Next year we expect to add a large number of lots to our list.

"We were able to run a small market of our own—co-operatively managed and this move led with the co-operation of the ladies association to the re-opening of the city market.

"We hope to reduce somewhat the fee of $2.50. It is very small considering the results the gardens yield.

"I had one garden and so also had some others of our committee. My little 25 foot lot kept our table supplied all sumser with abundance of green stuff, lettuce, Swiss Chard, spinach, peas, beans, tomatoes, corn, onions, carrots, turnips, celery, potatoes and cabbage, enough to do us all winter. The soil here is wonderful in its fertility.

"We used the newspapers freely. Our secretary was most indefatigable. The chairman and secretary necessarily do most of the work. Some of the stores gave plants, tools and special seeds at reduced prices to all who presented one of our cards.

"We have decided to recommend all our gardeners who use hot beds and cold frames to eschew glass and to use factory cotton instead. It costs less, does not grow so hot during the day nor so cool at night. The plants get more air and are in every way harder and stand transplanting better.

"One edge of the factory cotton we tack to the higher side of the frame and the other edge is tacked to a lath or roller. The cotton is in this way easily rolled up and when spread over the frame the weight of the roller keeps it in place. Lath may be used as rafters to keep it from sagging during a rain and injuring the plants."

* * *

Dr. C. C. James, Agricultural Commissioner for Canada, in discussing this topic said:

"This task is not limited to the farmers. There is a task laid upon all towns and cities. These have been growing and expanding, extending their boundaries, until to-day there must be, at least, one hundred thousand acres lying idle, unproductive, but cultivable in our towns and cities. Living nearby are tens of thousands out of work. Schemes have been suggested of taking the landless men out to the manless lands to grow wheat. That would probably cost $2 to grow $1 worth of wheat. It would not be economical—a waste of men and money.

"Why take these men in thousands to the land to grow crops about which they know nothing when right at their doors are vacant lands that will produce food? Surely the cities can secure the use of this vacant land, and set some of the unemployed at work growing potatoes and other vegetables, crops that require labour all through the summer. Under proper supervision men with little or no farming experience can be used to produce food of this kind. They will be paid for their work and a double purpose served. Every ton of food thus produced releases another ton for export.

"Among the city unemployed there may be many who would gladly help the farmers and who would be of some real value. Schemes for placing men of some farming experience with farmers who need help should receive attention in every city. It seems so easy now to organize committees for relief work abroad. Why not turn some of this organizing energy and enthusiasm into relief at home along these lines. Committees of this kind should have rural representatives on them, including officers of the women's institutes who have recently proved their efficiency."

THE PROTECTION OF BIRDS.

A meeting of the members of the Canadian Society for the Protection of Birds was held at the Royal Canadian Institute, Toronto, on December 16th, 1914. Mr. George H. Carson directed the meeting and called attention to the fact that, while many societies exist in the United States for the preservation of birds, Canada has been behind in the movement, and that this association is the first of its kind in this country. An election of officers for 1914-15 resulted as follows:—President Miss Helen M. Merrill; vice-presidents, Dr. C. K. Clarke and Mr. S. T. Wood; general secretary, Miss Laura B. Durand; assistant secretary, Miss Day; directors: Col. Fred Macqueen, Mr. George H. Carson, Mr. F. F. Payne, Mr. J. A. Harvey, Mr. Charles E. Fleming, Col. G. S. Ryerson, Mrs. S. T. Wood, Miss B. A. Ewan, Miss A. Munro, Mrs. R. L. Brereton, Mrs. E. A. Miller, Mrs. Allen Baines. It was resolved to apply immediately for incorporation of the association under the name of the Canadian Society for the Protection of Birds.

FUTURITY STAKES FOR PERCHERONS.

THE Canadian Percheron Horse Breeders' Association, two years ago inaugurated a system of futurity Stakes for Percheron foals. The secretary states that it is proving of great benefit in inducing breeders to take good care of their young stock. Entries are made of foals to be shown as yearlings. They must have been bred in Canada and are registered in the Canadian Percheron Stud Book. Two classes are provided, one for males and one for females. An entry fee of five dollars is charged for each foal and to the funds thus provided is added $500 donated by the Canadian Percheron Horse Breeders' Association, besides contributions solicited from other sources. All moneys except entry fees are divided equally between the sexes, but entry fees for filly foals go to filly stakes and for stallion foals to colt stakes. The exhibition in 1915 will be held between June 1st and September 15th on the grounds of the Association offering to add the largest sum to the stakes.

Last year the total stakes amounted to $1,450 of which $675 was awarded in five prizes for stallions and $740 in eight prizes for fillies, leaving $35 in the treasury.

The officers of the Canadian Percheron Horse Association are: Vice-President, Mr. E. A. Davenport, Acme, Alta., and secretary, F. R. Pike, Pekisko, Alta. The late J. C. Drewery Cowley, Alta., was president at the time of his death on December 28th, 1914.

A COUNTY BOARD OF AGRICULTURE.

THE first regular meeting of the County Board of Agriculture for Leeds and Grenville counties was held in December. In a letter to THE AGRICULTURAL GAZETTE, Mr. W. H. Smith, B.S.A., District Representative for the united counties, says:—"The purpose of the organization is to bring the different Farmers' Clubs of the counties into closer touch with each other, and endeavour to have them working on a systematic basis along lines which would tend to mark a decided advance in a given direction. As a result of the first County Board meeting it has been decided to hold a series of meetings during the winter months with the different clubs, where the following subjects:—seeds, cheese, fertilizer, vegetables, co-operation, poultry, swine and dairying, will be discussed. The clubs will hold their meetings in a series, thus reducing the expense of bringing speakers to a minimum.

"In addition to the regular series of meetings, the Board contemplates holding a standing field crop competition for the county, and expects to establish two centres for the development of registered seed."

The members elected to the executive committee of the Board are: Mr. B. N. Cannon of Crosby Farmers' Club; Mr. J. D. Johnson of Soperton-Oakleaf Farmers' Club; and Mr. Holmes Eyer of Harlem Farmers' Club, with C. F. Rath of Lansdowne, President of the Farmers' Institute, and W. H. Smith, District Representative of the counties as additional members of the Board.

The chairman of the Board is Mr. Holmes Eyre of Chantry, secretary-treasurer, J. D. Johnston of Soperton.

A SCHOOL CHILDREN'S PIG CLUB.

THE High School at Stonewall, Manitoba, has a very efficient agricultural department. It carries on school gardening, manual training, and, during the winter months, a special course is given in agricultural instruction. Poultry, potato and pig clubs have also been added, and a very successful fair held.

To encourage the pig club, on the solicitation of the chairman of the school board, a member of one of the large meat packing firms furnished the money to buy the pigs, carried the investment until the autumn and repurchased the pigs at the highest market price, deducting the actual purchase price. In addition this firm donated $25.00 in cash prizes.

Five boys secured pigs from their fathers and the school board purchased thirty and gave them out in pairs to fifteen boys. One little girl who had a pig feeding was allowed to join the contest. Each boy got one pig of the same age on May 16th; and on May 23rd the second pig from a slightly younger lot. All the pigs were weighed when given out and a record of the weight, age, sex and breeding kept. A chart was given to each feeder to record the rations fed. The pigs, which were fed according to directions received from the Department of Agriculture, were weighed at regular intervals.

Although the feeding was done by twenty-two different inexperienced feeders, the gain during the first twenty-seven days was approximately one pound per day. In the second period one pig gained forty-four pounds while its mate gained thirty-seven and a half. A pair of pure bred Berkshires, in the hands of one boy, gained, in twenty-eight days, thirty-five pounds and forty-three pounds respectively and at three months of age they each weighed ninety-six pounds.

Two other pigs weighed within a quarter of a pound of each other, and another pig which made only fair gains in the first month, gained thirty-nine pounds during the second, and so on while the contest lasted as shown by the following table which represents about half the pigs in the contest:

No. on Pig.	Date Farrowed.	Date of weighing out.	Weight, 1st weighing.	Weight June 12.	Weight July 10.	Weight Aug. 14.	Weight Sept. 24.	Age in Days.
X.	April 7	May 16	26	63	100	168	238	170
Y.	" 26	" 16	17	42	86	165	245	152
20	" 7	" 16	17½	45	88	128	223½	170
19	" 16	" 23	14½	29	58	191	167	161
30	" 6	June 12	—	61	96	158	210	171
60	" 6	" 12	—	53	96	161	213	171
26	" 7	May 16	20	37½	66	101½	142	170
41	" 16	" 23	17	38	67	135½	220	161
39	" 7	" 16	17¾	43	78½	127	197	170
34	" 16	" 23	23	52	62	121	197	161
11	" 7	" 16	18¾	54	91	129	194	170
49	" 16	" 23	18	38	76	115	159	161
52	" 7	" 16	17¾	56	88	129	166	170
66	" 16	" 23	11	39	65	110	164	161

Mr. Ira Stratton, Chairman of the School Board, has from the expense accounts and ration charts handed in by the competitors, worked out conclusions with respect to the profits made. Most of the boys made a profit. The feeder of Nos. 19 and 20 showed a feeding cost of $11.97, purchase price $7.00, expenses at fair and shipping, $1.20. Profit over all of $11.96. As this pig won a $7.00 prize in addition, he proved a very profitable animal.

The boy who fed Nos. 52 and 66 made a net profit over all of $8.00. A girl competitor made a net profit of $4.81 on her one pig, and won a prize of $4.00. She also won a prize in the open competition of the Rockwood Agricultural Society.

A boy whose pigs are not mentioned in accompanying table and who did not win a prize, had a profit of $8.72. One boy, who fed his pigs in town with reasonable success so far as growth was concerned, found he had a profit of 44 cents. Still another lad had no profit. His pigs were among those indifferently cared for.

Pigs numbered 39 and 34 earned their owner a profit of $15.85. He made use of rape pasture in his rations. The Berkshires, Nos. 30 and 60 made a total profit of $13.80, besides winning $6.00 of the prize money and a special prize.

No. 41 won $5.00 in prize money. With its mate, No. 26, it earned a profit of $14.78. These were fed on chop and skim-milk.

EASTERN ONTARIO DAIRY TEST.

A three days' milking test was held at the Eastern Ontario Winter Fair at Ottawa during the second week of January. The championship was won by the three-year-old cow, Mercedes Lady Mechhilde, owned by W. H. Cherry, Hagersville, Ontario, that gave 203 pounds of milk, testing 5.3 per cent fat. The following records were made by the first prize animals in each pure bred class:

AYRSHIRES.

Age, Months.	Name.	Owner.	Lb. Milk.	Per cent. Fat.	Total Points.
Over 48......	Adalia VI.........	R. R. Ness, Howick, Que..	153.1	4.0	194.98
Between 36 and 48.....	Redhill's Grey Lass	R. R. Ness, Howick, Que..	142.7	3.8	174.38
Under 36......	White Floss of Springbank.....	J. Hudson & Son, Lyn, Ont.	147.	4.2	174.38

HOLSTEINS.

Over 48......	Princess Aberkirk Cubana.........	W. H. Cherry, Hagersville, Ont..................	241.	3.5	275.74
Between 36 and 48.....	Mercedes Lady Mechhilde......	W. H. Cherry, Hagersville, Ont..................	203.	5.3	326.36
Under 36......	Pauline Colantha Mercena.........	A. E. Hulet, Norwich, Ont.	191.6	3.9	233.76
Under 24.....	Fayne Segis DeKol.	R. M. Holtby, Port Perry, Ont..................	165.5	3.0	171.15

SHORTHORNS.

Over 48......	Lady Robins......	W. J. Beattie, Guelph, Ont.	178.9	3.9	222.89
Between 36 and 48.....	Butterfly Bloom...	W. J. Beattie, Guelph, Ont.	129.	3.9	170.7
Under 36.....	Braemer Beauty...	W. J. Beattie, Guelph, Ont.	85.8	4.4	128.11

JERSEYS.

Over 48......	Donaldy Lyle.....	B. H. Bull & Son, Brampton, Ont...............	145.1	5.2	228.24
Between 36 and 48.....	Brampton Bright.. Kathleen.........	B. H. Hull & Son, Brampton, Ont...............	109.4	4.8	163.77
Under 36....	Renas Glow IV....	B. H. Bull & Son, Brampton, Ont...............	105.5	4.1	138.40

THE INSPECTION AND SALE ACT.

THERE came into force with the New Year an amendment to the Inspection and Sale Act with respect to the weight of certain agricultural seeds and vegetables, and some other products.

Clause 17 of the amendment reads as follows:—

A bushel of any article mentioned in this sub-section shall mean, unless a bushel by measure is specially agreed upon, that number of Dominion standard pounds of such articles which is shown in this sub-section opposite the name of such articles:

DESCRIPTION.	Standard Lb.
Artichokes	56
Beans	60
Beets	50
Bituminous Coal	70
Blue Grass Seed	14
Carrots	50
Castor Beans	40
Clover Seed	60
Hemp Seed	44
Lime	70
Malt	36
Onions	50
Parsnips	45
Potatoes	60
Timothy Seed	48
Turnips	50

A bag of any article mentioned in this sub-section shall contain that number of Dominion standard pounds of such article which is shown in this sub-section opposite the name of such article.

Artichokes	84
Beets	75
Carrots	75
Onions	75
Parsnips	65
Potatoes	90
Turnips	75

An important feature in connection with the new act is that the weight of the contents of any bag, sack or package of any of the cereal products mentioned must be stated thereon, and that uniform weights per bushel or bag for vegetables are established throughout the whole of Canada.

STATEMENT OF STALLIONS ENROLLED IN CANADA IN 1914.

BREED.	P.E.I.	N.S.	Ont.	Man.	Sask.	Alta.	B.C.	Totals in breeds & Provinces.	Total of all horses enrolled.
Clydesdale	27	37	1313	500	353	97	36	2363	
Percheron	6	7	308	155	147	77	9	709	
Shires	2		73	20	19	17	2	133	
Suffolk				8	10	4	3	25	
Belgian			21		25	10	3	59	
Draught				21				21	
French Draft							4	4	
French Canadian		1	4					5	
Standard Bred	19	43	232	55	54	17	5	425	
Thoroughbred		2	43	14		4	6	69	
Hackney	1	5	72	15	16	5	8	121	
Coach				8				8	
French Coach	1	3	5				2	11	
German Coach		1	7					8	
Kentucky Saddle Horse					1			1	
Any other Breed			5		1		4	10	
Total No. of pure-bred horses enrolled in each province	56	99	2083	796	629	231	82		3976
Grades	48	81	1118	175	132	186	8		1748
Cross Breds	15	89							104
Scrubs					113				113
Total No. of horses enrolled in each province	119	269	3201	971	874	417	90		5941

SOCIETIES AND ASSOCIATIONS.

CO-OPERATIVE LIVE STOCK ASSOCIATIONS.

IN the December number of THE AGRICULTURAL GAZETTE reference was made on page 1037 to the action of the Lethbridge Board of Trade in providing funds to enable farmers with little capital to purchase live stock. Similar action has been taken in other Western centres and it is understood with good effect. At Calgary, Alberta; Canora and Elfros, Saskatchewan, co-operative live stock associations have been organized, and at London, Ontario, a joint stock company has been formed for the marketing of live stock.

THE CALGARY ASSOCIATION.

The manager of the Canadian Bank of Commerce at Calgary advised THE GAZETTE that the association at Calgary was formed by citizens of the city and that farmers are taking a keen interest in it.

The objects for which the company is established are to further the developments of the live stock and dairying industries of Alberta, and with this object in view to assist farmers to purchase live stock either by according them direct credit or by becoming surety for credit obtained by them elsewhere in connection with the purchase of live stock; also to act as dealers in live stock or dead stock and the products thereof.

The capital of the company is $25,000 divided into 250 shares of $100 each.

The directors of the Company are: R. J. Hutchings, D. S. Campbell, Dr. J. G. Rutherford, P. Pallison and William H. Willson, all of Calgary, each of whom has subscribed for at least one share of stock.

THE ELFROS CO-OPERATIVE LIVE STOCK ASSOCIATION.

The Elfros Co-operative Live Stock Association is capitalized at $40,000 divided into 400 shares of $100 each.

The object of the Company shall be to promote mixed farming in each and every district in which the Company may from time to time operate.

(a) By purchasing live stock in large or small quantities and reselling to the individual shareholders, with the provision that all and any live stock thus sold shall be sold by the Company to the shareholders at a reasonable profit, the amount of which profit shall be decided by the directors, but which shall in no case exceed a net profit of five percentum of the actual cost price of the stock so sold as delivered at any point at which such sale takes place, and any and all such profit shall form part of the general funds of the Company.

(b) By marketing or assisting in the marketing of any live stock that the shareholders may from time to time wish to sell.

The secretary, Mr. A. Kristinson, has advised THE GAZETTE of the arrangements upon which the business of the association will be handled.

"Any shareholder wishing the association to purchase cattle for him, makes an application for the stock he wishes to acquire, giving some description of the animals, and stating the highest price which he is willing to pay for the animal upon its arrival. The association then secures the live stock required. The funds required to pay for them in the first place, we secure from the bank, and as security for an advance so made we allocate to the bank such as is required of the company's shares of stock, or rather the unpaid portions of such shares. In making settlements with the purchasers of the stock, we take their personal notes, made payable to the bank. These notes the company endorses as surety, and taking them to the bank secure cash for their face value, which goes towards taking up the advance secured for paying for the stock in the first place. As security for our suretiship we also hold a chattel mortgage on all the animals which we thus sell. The time we are able, through our arrangements with the bank, to allow on the animals, is from 1 to 2 years, and in cases where it can be shown that such a length of time would be advantageous we can allow 3. This length of time is permitted in view of the fact that we are desirous of giving each purchaser all the chance possible to make the animals pay for themselves through what they can produce, thus enabling him to get into the business without withdrawing any capital for that purpose from any of his other operations.

"As to the extent to which the farmers here are taking the matter up, I may say that it appears commonly acknowledged that this is the best practical proposition yet advanced. We have already sold in the neighbourhood of 100 shares, and have just lately purchased our first shipment of cattle, which consisted of some seventy-four head. This was all taken out the day after it arrived. We are now expecting the arrival of another shipment of two carloads, mostly all heifers, and these also are all sold beforehand. Our greatest difficulty is going to be in finding some place where we can secure at reasonable prices a good uniform grade of cattle, which will serve, besides increasing the amount of live stock here, to improve the class of live stock in the community.

"I would also point out that this is not entered into for any one's personal benefit. We have not advertised it, and have not asked a single man to join it. Judging from the interest aroused when it became known that we had secured our charter, and were ready to do business I venture to say that had it been at all advertised we would have been overwhelmed with applications for shares and also for live stock. It was because this is a new venture and we are anxious for its success that we have allowed it to remain quiet, our idea being to allow it to work out in its details before taking any steps to make it really public. We have now however, reason to believe that it is destined to become a great success, and we expect great results from it for our community in the future."

THE CANORA ASSOCIATION.

The manager of the Canadian Bank of Commerce at Canora sent THE GAZETTE a copy of the by-laws of the Canora Live Stock Company and writes as follows:

"The Company was organized last spring with a capital of $25,000 in shares of $100; most of the shares are being subscribed for by farmers. The object of the Association is to enable the farmers to obtain pure bred stock at the smallest possible cost. As soon as applications for a carload of stock have been received the company's buyers purchase the required number of animals, and on delivery the bank advances the money direct to the farmers on their personal notes secured by the endorsement of the association. In order to protect themselves the company then take chattel mortgages on the stock. About fifty brood sows were distributed last spring and the increase from these at the present time number over 300. The first annual sale was held December 2nd, but owing to the high price of feed and the unsatisfactory conditions of the stock market only about 50 hogs were disposed of to various farmers in the district.

"The farmers around Canora are however more and more realizing the advantages of mixed farming and the necessity of improving the quality of their stock and I expect, as soon as conditions again become normal, that the live stock industry in this part of the country will show great development."

WESTERN ONTARIO ASSOCIATION.

At a meeting of representative stock breeders for Western Ontario held in London, on December 31st, 1914, a joint stock company subscribed $5,000 in shares of $10 each. The purpose of the company is to sell live stock on consignment at London.

The Western Fair Association granted the organization the use of the Western Fair grounds and buildings. It was proposed that monthly sales be held. It was suggested that pure bred stock and grade stock alike be disposed of. The details for carrying on the work are in the hands of the following provincial directors: S. R. MacVittie, Munsey; Captain T. E. Robson, London; J. D. Brine, Ridgetown; Harry Smith, Hay; J. T. Gibson, Denfield.

The annual convention of the Northumberland and Durham Apple Growers' Association was held in Cobourg, Ont., on Tuesday, January 26th. The following officers were elected:

President, F. B. Lovekin, Newcastle; secretary-treasurer, R. S. Duncan, Port Hope; directors, W. J. Bragg, Bowmanville, R.R. No. 4, W. H. Gibson, Newcastle, W. S. Dunbar, Perrytown, S. W. Staples, Baltimore, J. G. Wait, Colborne, R.R. No. 3, J. W. Turpin, Colborne, H. Sirrett, Brighton, W. H. Dempsey, Trenton.

The following are the officers of the Vancouver Flockmaster's Association for the year 1915:

President, G. H. Hadwen, Duncan's; vice-president, H. D. Evans; secretary-treasurer, A. C. Aitken, Duncan's.

THE LIVE STOCK ASSOCIATIONS OF MANITOBA.

THE annual meetings of the Manitoba Live Stock Associations, held in Brandon, January 12th and 13, were the most successful conventions held under these auspices for several years, as practically the whole of two days was devoted to the business affairs of the associations and to addresses and discussions of topics of vital interest to the farmers generally, as well as to the breeders of pure bred live stock.

Following an address by J. D. McGregor on "The use of Screenings as Feed for Live Stock" a very interesting discussion ensued and a committee was appointed to investigate as to the possibility of having the screenings, something in the neighbourhood of 70,000 tons annually, reshipped from the head of the lakes, treated in such a way as to insure the destruction of all weed seeds and utilized for the feeding of stock.

Co-operative Marketing, Killing and Cold Storage were also discussed at length and a joint committee with the Grain Growers of Manitoba appointed to investigate and report.

The efforts of the Sheep Breeders' Association in bringing in breeding ewes, in carload lots, and distributing them to farmers in all parts of the province at cost prices was highly commended, and the association urged to continue this work, as nothing more important can be done for the welfare of the province than the introduction of sheep on the farms, not only from their economic benefit, but on account of their value in the destruction of weeds.

Last year the association having handled the wool for all the members of the province through the assistance of expert graders sent out by the Dominion Department of Agriculture, obtained therefor the highest price ever realized by the farmers of Manitoba for wool, viz., 19.6c. The association was urged to continue its efforts in this line.

A protest was entered against the proposed increased classification by the railroad companies on less than car load lots of dressed hogs, such movement being considered detrimental to the interests of mixed farming.

The Stallion Enrolment Act which had been passed at the last session of the Manitoba Legislature was approved and the department requested to put the Act into operation forthwith. Some amendments in the composition and a committee to take charge of the Act, were suggested.

A resolution submitted from the Alberta Horse Breeders' Association suggesting that added restrictions should be placed on the importation of pure bred horses from the United States, looking to debar horses with hereditary unsoundness was discussed and referred to the Western Canada Live Stock Union.

The Cattle Breeders' Association decided to continue holding their annual sale of pure bred bulls, which has in the past proved a very great benefit in helping farmers secure at their own prices, sires of good quality, delivered at their nearest railway station at minimum charges for freight and care.

The Manitoba Poultry Association represented by its executive took up the question of closer co-operation with the Live Stock Association.

The elections resulted as follows:—

Cattle Breeders' Association:

President—J. G. Barron, Carberry.
Vice-President—A. Graham, Pomeroy.
Secretary—Geo. H. Greig, Winnipeg.
Directors—J. Graham, M.P.P., Carberry; J. R. Hume, Souris; Jas. Duthie, Hartney; J. A. Chapman, Hayfield.

Horse Breeders' Association:

President—J. G. Washington, Ninga.
Vice-President—John Scarff, Hartney.
Secretary—Geo. H. Greig, Winnipeg.
Directors—Wm. McKirdy, Napinka; Freeman Rice, Binscarth; John Wishart, Portage la Prairie; A. C. McPhail, Brandon.

Sheep Breeders' Association:

Hon. President—J. D. McGregor, Brandon.
President—Geo. Allison, Burnbank.
Vice-President—A. D. Gamley, Griswold.
Secretary—Geo. H. Greig, Winnipeg.
Directors—A. J. McKay, Macdonald; Geo. Gordon, Oak Lake; Thos. Sanderson, Holland; W. H. English, Harding; J. A. Chapman, Hayfield.

Swine Breeders' Association:

President—W. H. English, Harding.
Vice-President—J. G. Barron, Carberry.
Secretary—Geo. H. Greig, Winnipeg.
Directors—A. C. McPhail, Brandon; C. W. Weaver, Deloraine; J. H. Dalgleish, Grandview; David Agnew, Douglas; J. A. Chapman, Hayfield.

PEDIGREE REGISTRATION IN CANADA.

The following tables give the names of the nationalized Record Associations in Canada and the number of pedigrees and transfers of ownership recorded during the past five years and the memberships of the different associations.

COMPARATIVE STATEMENT FOR THE YEARS 1910, 1911, 1912, 1913, AND 1914, SHOWING PEDIGREES AND TRANSFERS RECORDED.

Association.	Pedigrees Recorded.					Transfers Recorded.				
	1910	1911	1912	1913	1914	1910	1911	1912	1913	1914
Shorthorn	7544	7430	6681	9173	10186	3044	2639	2763	3647	5813
Ayrshire	2395	2833	3111	3629	3496	1079	1254	1487	1418	1364
Hereford	819	1295	1707	1820	2543	345	340	301	634	869
Swine	8205	7136	6802	11509	14441	537	732	744	1231	1916
Clydesdale	5702	3864	4065	3678	2900	2078	2400	2859	3616	2773
Hackney	167	138	144	167	101	67	67	120	162	129
Shire	126	190	190	274	135	55	71	100	149	93
Thoroughbred	243	276	134	313	194	22	22	37	70	69
Sheep	2105	2856	3981	3934	4826	309	664	688	645	1372
Aberdeen Angus	917	772	946	1010	1541	222	236	334	652	761
Galloway	71	38	72	23	91	40	6	24	6	7
Jersey	543	715	850	1135	1215	141	336	321	675	732
Red Polled	196	145	268	459	102	20	22	29	24	37
Guernsey	87	99	206	87	154	30	17	39	48	35
Canadian Cattle	257	325	323	341	338	86	115	126	86	117
Canadian Horses	118	61	383	96	53	16	16	28	24	15
Pony	102	88	78	329	228	2	8	43	15	25
Belgian	163	132	142	106	132	22	49	81	92	83
Percheron	969	1393	1580	1560	962	87	229	313	556	486
Suffolk	22	100	51	86	31	...	5	6	18	29
French Coach	12	13	22	6	19	...	...	....	8	5
Standard Bred	42	302	358	560	361	...	4	17	93	164
Totals	30805	30201	32094	40295	44049	8202	9232	10460	13869	16894

MEMBERSHIP OF LIVE STOCK ASSOCIATIONS IN CANADA, 1914.

	Ont.	Man.	Sask.	Alta.	B.C.	Que.	N.B.	N.S.	P.E.I.	U.S.	G.B.	
Clydesdale	1382	349	269	139	35	72	8	15	9	7	3	2288
Shorthorn	1342	359	208	211	11	56	15	40	9	2	..	2253
Ayrshire	390	35	29	64	20	561	39	48	24	12	..	1222
Swine	270	110	206	216	27	188	17	12	9	2	..	1057
Sheep	197	26	26	24	7	245	7	13	10	3	..	558
Hereford	127	64	51	80	2	3	1	4	..	10	..	342
Jersey	169	18	14	21	30	34	21	16	5	3	..	331
Percheron	71	41	68	77	2	10	1	1	..	7	..	278
Angus	91	39	29	46	2	2	..	..	3	2	..	212
French Cattle	2	1	..	..	..	185	1	..	..	2	..	191
Hackney	87	9	12	13	14	17	3	2	1	10	1	169
French Horses	3	1	..	..	..	179	1	..	..	1	..	185
Standard Bred	89	17	25	26	10	13	1	2	3	2	..	188
Pony	89	6	10	7	2	6	..	..	..	..	..	120
Shire	67	15	15	22	2	2	1	..	1	4	1	130
Thoroughbred	78	6	7	22	5	9	..	..	..	..	..	127
Belgian Draft	5	5	21	13	1	23	..	..	..	2	..	70
Guernsey	1	1	..	..	4	7	7	28	1	1	..	50
Red Polled	....	11	5	4	10	..	..	..	..	..	..	30
Galloway	9	7	3	7	..	..	..	..	..	..	..	26
Suffolk Punch	1	1	5	14	..	..	..	..	..	..	..	21
French Coach	....	..	2	3	..	..	..	..	..	..	..	5
Brown Swiss	1	..	..	..	..	3	..	1	..	..	..	5

THE CENTRAL CANADA VETERINARY ASSOCIATION.

THE 12th annual meeting of the Central Canada Veterinary Association was held in Ottawa on January 20th. The following officers were elected: Hon. President, Dr. F. Torrance, Veterinary Director General, Ottawa; president, Dr George Hilton, Chief Veterinary Inspector, Ottawa; vice-president, R. T. O'Hara, V.S., Maxwell, Ontario; secretary-treasurer, H. T. Sparks, V.S., Ottawa; council, C. H. Higgins, D.V.S., Pathologist, Health of Animals Branch, Ottawa; C. W. McGuire, V.S., Cornwall, Ontario; A. W. Harris, V.S., Ottawa; S. L. O'Hara, V.S., Shawville, Quebec; J. B. Hollingsworth, Chief Food Inspector, Ottawa; A. E. James, V.S., Ottawa; W. Moyniham, V.S., Ottawa, and P. W. O'Hara, V.S., Manotick, Ontario.

EASTERN ONTARIO DAIRYMEN'S ASSOCIATION.

The following are the officers of the Eastern Dairymen's Association for 1915: Honorary Presidents, Hon. Senator Derbyshire, Brockville; John R. Dargavel, M.L.A., Elgin; president, J. A. Sanderson, Oxford Station; first vice-president, J. N. Stone, Norham; second vice-president, H. C. Leggett, Newboro; third vice-president, Joseph McGrath, Mount Chesney; treasurer, James R. Anderson, Mountain View; secretary, T. A. Thompson, Almonte; executive committee, Henry Glendinning, Manilla; G. A. Gillespie, Peterboro; W. H. Olmstead, Bearbrook; Neil Fraser, Vankleek Hill; auditors, M. Bird and John Hyatt; stenographer, William Cook; T. A. Thompson and Ivan Publow were re-appointed public prosecutors.

WESTERN ONTARIO DAIRYMEN'S ASSOCIATION.

The annual meeting of the Dairymen's Association of Western Ontario, was held at St. Thomas, Ontario, on January 13 and 14. The following officers were elected:

President, Robert Myrick, Springford, Ont.; first vice-president, Jas. Bristow, St. Thomas, Ont.; second vice-president, R. W. Stratton, Guelph, Ont.; third vice-president, Wm. Rothwell, Hickson, Ont.; secretary-treasurer, Frank Herns, London, Ont.

DIRECTORS:—J. N. Paget, Canboro, Ont.; T. Ballantyne, Stratford, Ont.; J. H. Scott, Exeter, Ont.; Jas. Donaldson, Atwood, Ont.; J. MacHoover, Burgessville, Ont., and Geo. E. Booth, Ingersoll, Ont.

This Association in 1914 carried on a dairy herd competion amongst cheese factory patrons. The awards were based on the amount of milk per cow furnished to any cheese factory in Western Ontario from March 1st to October 31st, 1914, from herds of 8 cows or over.

The following were the winners:—

1. Jno. Vanslyke, Dunboyne; 100 acres in farm, 11 Holstein Grade Cows, 87,158 total lb. of milk—7,923 lb. of milk per cow.

2. J. C. Harkes, Listowel—100 acres in farm—8 Holstein Cows (2 P. B., 6 Grade) —59,095 total lb. milk 7,382 lb. of milk per cow.

3. D. Campbell, Komoka—100 acres in farm—13 Pure Bred Holstein Cows—89,272 total lb. of milk—6,867 lb. of milk per cow.

4. Frank Strobridge, Ingersoll,—50 acres in farm—10 Holstein Cows— 67,375 total lb. milk—6,737 lb. of milk per cow.

5. Wm. Arthur, Sparta,—100 acres in farm—10 Holstein and Shorthorn Cows—61,751 total lb. of milk—6,175 lb. of milk per cow.

6. H. W. Duncan, Atwood—100 acres in farm—10 Grade Holstein Cows—58,095 total lb. of milk—5,809 lb. of milk per cow.

7. Willis Johnson, Listowel—148 acres in farm—12 Holstein Grade Cows—67,235 total lb, of milk—5,603 lb. of milk per cow.

THE SASKATCHEWAN DAIRYMEN'S ASSOCIATION.

THE Saskatchewan Dairymen's Association, at their annual meeting held in January, adopted a constitution and set of by-laws as follows:—

This organization shall be known as the Saskatchewan Dairymen's Association and shall have for its object the advancement of the dairy industry, in all its branches in the province of Saskatchewan.

(a) By holding an Annual Convention.

(b) By co-operating with dairymen and creamery managers in the various sections in arousing interest in, and spreading information regarding dairying.

(c) By co-operating in promoting the educational work of the Department of Agriculture and College of Agriculture.

(d) By such other means as may be approved by the Minister of Agriculture.

(1) The officers of this Association shall consist of a President, Vice-President, Secretary-Treasurer, an Auditor and Board of Directors.

(2) The election of officers of this association shall be held at the regular annual meeting and said officers shall hold office until the next annual meeting or until their successors are elected.

(3) Each registered creamery company whose annual fees are paid shall be entitled to three delegates and each sub-association to one delegate. These official delegates only shall be entitled to vote.

Officers shall be elected by open ballot by delegates entitled to vote and shall receive a majority vote of the delegates present and voting.

(5) The associate membership shall consist of persons connected with or interested in dairying, subscribing one dollar membership fee annually. Honorary members may be elected by a majority vote of the members present at the annual meeting.

(6) The annual fee shall not be less than $10 and not more than $25 annually for each creamery company; and not less than $5 and not more than $15 for each sub-association. The amount to be paid shall be determined annually by the directors of the Association.

(7) At each annual meeting a Board of seven directors shall be elected. The Directors shall from themselves elect two members to form with the President, Vice-President and Secretary-Treasurer an Executive Committee of the Association. The annual meeting of the Association shall be held at the time and place of meeting of the Agricultural Societies' Convention or the Winter Fair.

(8) The auditor and secretary-treasurer shall be appointed annually by the directors.

The following resolutions were passed:

Resolved, that in the opinion of this convention, seals are a more satisfactory means than locks for securing lids on cans and we would suggest that creameries in future employ seals on all cans.

Resolved, that this convention express its approval of the policy of cream and butter grading now in operation in government operated creameries.

Resolved, that the Express Companies be requested to ask their employees to exercise greater care in the handling of cream cans.

Resolved, that in view of the growing importance of the dairy industry in the province, it would be of very great advantage to dairymen generally if a system of cow testing associations could be established in the various dairy districts of Saskatchewan.

Resolved, that in the opinion of this convention, the attention of dairymen and stock keepers generally be called to the great importance of retaining on their farms as far as possible all female stock suitable for breeding purposes, we being firmly convinced that the present unprecedented difficult conditions will shortly disappear.

The following officers were elected:

President, W. A. McCorkell, Moosomin; vice-president, Geo. Harris, Paynton; secretary, Prof. K. G. MacKay, Saskatoon.

DIRECTORS: Charles Hankins, Valparaiso, Sask.; R. H. Bobier, Tantallon, Sask.; Henry Kaiser, Moosomin, Sask.; W. H. Frith, Melville, Sask.; A. E. Engesetter, Birch Hills, Sask.; A. H. Salmon, Kelso, Sask.; L. C. Wirtz, Wadena, Sask.

At a meeting of the directors following the convention this body, in accordance with section 6 of the Constitution and By-Laws, fixed the annual fees at $15 and $5 for creamery companies and sub-associations respectively.

THE ALBERTA POULTRY ASSOCIATION.

The Alberta Poultry Association, at its annual meeting at Edmonton on January 6th, amended its constitution by providing that any person debarred from showing by a local association shall have the right to appeal to the executive committee of the provincial association, within 30 days of his debarment, the decision of this committee to be final. This provision was made retroactive, thereby allowing persons now debarred to appeal within 30 days of notification of this change in the constitution.

A motion was passed also providing that members of local poultry associations, affiliated with the provincial association, be requested to refrain from showing their birds at poultry shows or exhibitions not so affiliated.

The election of officers resulted as follows:

President, R. B. Hunter, Edmonton; first vice-president, W. J. McKenzie, Claresholm; second vice-president, A. E. Humphries, Lethbridge; secretary-treasurer, W. McC. Moore, Edmonton.

EXECUTIVE COMMITTEE: W. R. Blew, Calgary; P. Ashcroft, Lethbridge; J. C. Longmore, Edmonton; R. E. Moffatt, Claresholm ; James Blair, Granum ; George Stevenson, Camrose; Percy R. Banks, Lacombe.

THE NOVA SCOTIA POULTRY ASSOCIATION.

The third annual meeting of the Nova Scotia Poultry Association was held at the Agricultural College on January 14th, 1915.

Representatives were present from the different county poultry clubs and egg circles of the province.

The president, Mr. W. W. Osborne, New Glasgow gave a brief outline of what had been done for the poultry industry in the past year.

The secretary stated that it was not possible, under present circumstances, to expect further assistance to the larger county clubs, but it would be as much as could be expected to have the same assistance as was given during the past year. It was resolved that the members ask the department to give the same, and, if possible, a little more assistance to the County Poultry Shows.

After some discussion regarding uniform prize lists, it was resolved that the secretary draw up a prize list and rules, to be submitted to the different clubs, and, if adopted, they be the standard prize lists and rules for all County Shows in the province.

A discussion took place respecting the protection of members who have received eggs and stock from breeders. It was decided that all members who have felt that they were unjustly dealt with by any breeder within or outside the province should write the secretary to have the matter dealt with in the name of the Association.

The election of officers resulted as follows:—

President, W. W. Osborne, New Glasgow.

Vice-President, F. E. Jackson, North Sydney.

Secretary-Treasurer, J. P. Landry, Truro.

Executive Committee:—E. E. Frehill, New Glasgow; W. A. Godfrey, Yarmouth; D. W. Brodie, Glace Bay; W. H. Henry, Shubenacadie; C. H. Wisener, Pictou; James McConnell, Antigonish; Edson Griffin, Port Williams.

THE PURE MAPLE SUGAR AND SYRUP AGRICULTURAL CO-OPERATIVE ASSOCIATION.

At the annual meeting of the Pure Maple Sugar and Syrup Agricultural Cooperative Association, held at Beauceille, Que., on January 12th, it was resolved that the federal authorities be asked to appoint inspectors in connection with the enforcement of the Adulteration Act of 1914 with respect to maple products.

The following were the officers elected for 1915: President, Gustave Boyer, M.P.; vice-president, Chas. A. Fisk, Abbotsford, secretary, J. H. Lefebvre, Waterloo; Directors, J. H. Grimm, Montreal; R. T. Brownlee, Hemmingford; L. J. A. Dupuis, Desaulniers.

THE ONTARIO AGRICULTURAL AND EXPERIMENTAL UNION.

THE 36th annual convention of the Ontario Agricultural and Experimental Union was held at the Ontario Agricultural College, Guelph, on January 12th and 13th. The following officers and directors were elected.

President, Herbert Groh, Preston; vice-president, J. B. Fairbairn, Vineland; secretary, Prof. C. A. Zavitz, Guelph; assistant-secretary, Professor W. J. Squirrell, Guelph; treasurer, A. W. Mason, Guelph.

DIRECTORS:—Dr. G. C. Creelman, Guelph; H. L. Beckett, Hamilton; R. S. Duncan, Port Hope; H. Sirrett, Brighton; J. E. McLarty, Guelph.

AUDITORS:—R. R. Graham, Guelph; S. H. Gandier, Guelph.

The following committee, on the prevention of the importation and the distribution of noxious weed seeds in grains and in screening was appointed.

G. H. Clark, Seed Commissioner, Ottawa, chairman; J. R. Dymond, Seed Branch, Ottawa; Professors R. Harcourt, G. E. Day and J. E. Howitt, O.A.C., Guelph.

The committee consisting of Prof. J. E. Howitt, chairman, Hon. Nelson Monteith and Mr. W. J. Lennox, to make a study of the present Weed Acts of the different provinces of Canada, and if thought advisable to make suggestions as to how the eradication of weeds in Ontario could be made more effectual, reported progress and made certain recommendations. This committee was reappointed for 1915, and was authorized by the meeting to carry out the recommendations of the report.

THE WESTERN ONTARIO SEED GROWERS' ASSOCIATION.

BY L. H. NEWMAN, SEC., CANADIAN SEED GROWERS' ASSOCIATION, OTTAWA.

At the annual meeting of members of the Canadian Seed Growers' Association, resident in Ontario, which was held in connection with the Ontario Provincial Winter Fair at Guelph in December, there was organized an Association known as "The Western Ontario Seed Growers' Association." This Association is composed of growers whose seed may not be eligible for registration as "Registered Seed" in the Canadian Seed Growers' Association but which nevertheless may be of extra good quality, purity and vitality. Confining its effort to this class of growers, this new organization will not in any way compete with the C. S. G. A. but may rather be regarded as a training school for recruits for the latter body. The objects of this Association, as given in the Constitution are as follows:

> To encourage a general and constant improvement in the production and dissemination of all high class field root and vegetable seeds including cereals, clovers, grasses, roots and vegetables by
>
> (a) Co-operating with the Department of Agriculture.
>
> (b) Holding meetings to discuss matters of importance to the seed growing industry in the province.
>
> (c) Co-operating with exhibition and seed associations and societies, firms or individuals to advance the interests of the seed growing industry generally.
>
> (d) Holding or assisting to hold competitive exhibitions and educational meetings.

The officers of this Association are:—

Hon. President, George H. Clarke, Ottawa; hon. vice-president, Prof. C. A. Zavitz, Guelph; president, A. McKenny, Amherstburg; vice-president, Fred Foyston, Minesing; secretary-treasurer, R. W. Wade, Toronto.

On December 4th there was organized in Durham County, Ont., a potato seed growers' association known as "The Manvers Green Mountain Potato Seed Centre." The president is W. H. Hooper, Pontypool, R.R. No. 3, Ontario, and the secretary-treasurer, W. A. Jakeman, Pontypool, R.R. No.1.

The officers of the British Columbia Dairymen's Association for 1915 are as follows:

Honorary-president, A. C. Wells; president, William Duncan; secretary-treasurer, H. Rive; Directors, N. Grimmer, G. S. Harris, E. Raper, J. M. Steeves, P. Owens, P. H. Moore, W. N. Townsend and J. W. Berry.

REVIEWS.

Methods of Modern Agriculture, by Wm. MacDonald, D.Sc.; The Macmillan Company, New York and Toronto; 5 x 7½ inches; 81 pages.

This is a popularly written brief account of the life and accomplishments of the following renowned makers of modern agriculture: Jethro Tull, founder of the principles of dry farming; Coke of Norfolk, founder of experimental farms; Arthur Young, author of the Agricultural Tour; John Sinclair, founder of the British Board of Agriculture; Cyrus H. MacCormack, inventor of reapers. The following quotation is credited to Arthur Young: "The magic of properties turns sand into gold. Give a man the secure possession of a black rock and he will turn it into a garden; give him a nine years' lease of a garden and he will convert it into the desert."

The Imperial Year Book of the Dominion of Canada, 1914-15, John Lovel and & Son, Ltd., Montreal, contains 572 pages. This Year Book, which is concerned exclusively with Canada and the Empire, gives a concise and comprehensive review of Canadian life and activity since Confederation. The imperial section opens with a short historical sketch, showing the evolution of the Empire since the time when Newfoundland, the oldest British colony, first owed allegiance to the British crown. The work is divided into seven sections and the matter is so classified within these as to make the work a ready reference handbook.

NEW PUBLICATIONS.

THE DOMINION DEPARTMENT OF AGRICULTURE.

BULLETINS.

No. 79, Renovation of a Neglected Orchard, with special reference to the best orchard progress, by M. B. Davis, B.S.A., Assistant to the Dominion Horticulturist. This is an illustrated pamphlet of 32 pages. The information contained is of special interest to owners of orchards, more particularly in Eastern Canada, where owing to bad conditions they are giving their owners but small returns. The bulletin shows how, with a reasonable amount of labour, any such orchards, that are now little better than a menace to the local orchard industry, may be transformed into remunerative parts of the farm.

Publications Available for Distribution. This is a revised list of the bulletins and reports of the Department of Agriculture that are available for distribution. It contains publications of the Experimental Farms and each of the other Branches of the Department, and deals with practically all branches of agriculture.

Circular No. 7, Potash in Agriculture, by Frank T. Shutt, M.A., D.Sc., Dominion Chemist. This is a re-print of Dr. Shutt's article on Potash in Agriculture that appeared in the December number of THE AGRICULTURAL GAZETTE.

Agricultural War-Book. This handbook of 156 pages, bearing the slogan "Patriotism and Production", is a compilation of speeches and articles of foremost authorities, and statistics bearing upon the present and probable future supply of agricultural products as influenced by the war. It has been prepared for the information of officials and others interested in the general movement being carried on over Canada for increased production.

THE DAIRY AND COLD STORAGE BRANCH.

Bulletin No. 43, *The Cold Storage Act, 1907, As Amended in 1909, and Regulations.* This is a re-print of Bulletin 23 of the Dairy and Cold Storage Series, and contains, in addition, the regulations of June 20th, 1914.

THE LIVE STOCK BRANCH.

Bulletin No. 17, "Swine Husbandry in Canada." This is a companion book to Bulletin No. 12 "Sheep Husbandry in Canada," and No. 13 "Beef Raising in Canada." It contains brief histories and descriptions of the several breeds of swine reared in Canada, and deals with the breeding and rearing of the bacon hog. A section devoted to "Pork Production on Canadian Farms" describes how successful and persistent hog raisers rear and feed their animals. Housing and other features of the industry are also taken up.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE.

ONTARIO.

Swine, Bulletin No. 225, by G. E. Day, B.S.A., Professor of Animal Husbandry, Agricultural College, Guelph, containing 80 pages, profusely illustrated, is a most practical and complete statement, covering the selection, housing, feeding and general handling of the bacon hog. The various types of swine are described, with photo engravings of prize-winners at some of the leading live stock shows.

Annual Report of the Farmers' Institutes of the Province of Ontario, 1914. This is an announcement of the Farmers' and Women's Institute meetings for 1914 and 1915, statistical reports for 1914 and a list of speakers and subjects.

QUEBEC.

Thirty-Second Annual Report of the Dairymen's Association and of the Dairy School of the Province of Quebec. This is a pamphlet of more than three hundred pages containing a report of the Annual Convention, the laws concerning the inspection of creameries and cheese factories and concerning the manufacture of dairy products and many other matters of importance. The secretary of the Quebec Dairy Association is O. E. Dalaire, Director of the Dairy School of St. Hyacinthe.

SASKATCHEWAN.

Bulletin No. 42, *Suggested Lines of Co-operative Production*, by W. W. Thomson, B.S.A., Director Co-operative Organizations. This bulletin deals with community breeding associations, seed growing centres, co-operative egg circles and beef rings. It is a companion bulletin to one recently issued on co-operative live stock marketing.

BRITISH COLUMBIA.

Bulletin No. 59, Agricultural Statistics, 1913, The information is prepared in the form of district reports and table summaries for purposes of convenience. The province is divided into the following districts: Royal Mainland, Thompson River Watershed, Okanagan and Boundary, East and West Kootenays and Northern British Columbia. The bulletin is generously illustrated.

Full Report of the Royal Commission on Agriculture Appointed in December, 1912, Under the Public Enquiries Act. The Commission consisted of W. H. Hayward, Duncan; Alexander Lucas, Vancouver; S. Shannon, Cloverdale; Wm. Duncan, Commox; J. J. Campbell, Nelson; J. Kidston, Vernon. The Commission commenced early in January of 1913 and continued for seven months, holding sittings at 69 points in the Province, where they took evidence from more than six hundred witnesses, many of them representing farmers' institutes, agricultural associations, boards of trade, etc. Visits were then made by members of the Commission to other countries, viz.:—Great Britain, Ireland, Denmark, Germany, France, Holland, United States, New Zealand and Australia, besides other provinces of Canada. Practically every phase of agricultural conditions was gone into. The report which is divided into two parts occupies almost four hundred pages of well arranged matter.

MISCELLANEOUS.

Bulletin No. 568, United States Bureau of Education, *Elementary Education in England*, by I. L. Kendel. This is a pamphlet of one hundred and fifty-eight pages, divided into eighteen chapters under the heading of Nature Study. The bulletin says that no other subject in the school curriculum is so wide and unlimited in scope as nature study. Combined with object lessons this branch of school work is intended to have special reference to the surroundings of the scholars. The natural and historical features and plant life of the locality and the industries of the inhabitants have the view of forming the extension of intellectual and accurate observations. Such instruction is said to direct the attention of the scholars to real things making them acquainted with simple natural facts and will develop a love of nature.

Bulletin No. 618, United States Bureau of Education, Washington, *County Unit Organization for the Administration of Rural Schools*, by A. C. Monahan, Bureau of Education. In the United States three district rural school units of organization are to be found,—the district, the township and the county. In addition there are several instances of mixed systems in which responsibility for management is divided between the district and the township, the district and the county, or the township and the county. The purpose of the bulletin is to bring out the advantages of the larger unit of organization.

Bulletin No. 601, United States Bureau of Education, Washington, *Agricultural Teaching.* This is made up largely of papers presented at the Fourth Annual Meeting of the American Association for the advancement of agricultural teaching.

The Journal of the South Eastern Agricultural College, Wye, Kent, England, for the following years: 1907, 1909, 1910 and 1911. These are reports of the work of the South Eastern Agricultural College, including the college farm.

NOTES.

In response to an appeal from the Secretary, to the members of the Dairymen's Association of Western Ontario, for contributions towards the Patriotic Fund, there has been raised $4,400.

The Tablet, a financial Belgium journal, estimates that the damage, by the war, to the rural districts in Denmark, to crops, cattle, pigs, sheep, horses and farm buildings, amounted to about $283,614,000.

The final contest in connection with the Boys' Calf Feeding Competition, for which $1,000 in prizes will be distributed, will be held at Brandon, March 17th and 18th, 1915. The annual sale of pure bred bulls, conducted by the Manitoba Cattle Breeders' Association, will be held at the same time and place.

Mr. H. W. Watson, Director Elementary Agriculture, Nature Study Section, Department of Education of Manitoba has 250 lantern slides on school gardening, school grounds, school fairs, manual training, sewing, cooking, homes and grounds, streets beautified, parks, etc. Most of these were made from photographs taken by himself and are used for lecture work. Mr. Watson is adding to his slides as suitable negatives are secured. The slides cost him about 35 cents each when he furnishes the negative.

The South Eastern Agricultural College, situated in Wye, Kent, England, like Agricultural Colleges in Canada, conduct summer teachers' courses.

According to a journal of that college these courses last for about two weeks. A series of lectures are delivered on such subjects as the following: elementary and advanced plant pathology, poisons in plants, elementary chemistry, bacteriology, entomology, mythology, poultry-keeping and vegetable cultivation.

The afternoons are devoted to practical demonstrations in horticulture, gardening, land surveying, bee-keeping and poultry-keeping.

During the course public evening lectures are given on such subjects as cellulose and its uses and standard bread.

The Georgia Bankers' Association sent fifteen boys and fifteen girls to the short course of the State College of Agriculture.

The Farmers' and Women's Institutes of the province of British Columbia had, up to the end of December, 1914, contributed $4,350.65 towards the Patriotic Fund.

One hundred and forty-one farmers in Ontario carried on co-operative experiments with oats in 1914.

"In 91 per cent of the cases on those farms, the variety, O. A. C. No. 72, showed superiority over other varieties chosen by farmers. It is safe to say that this oat will be worth millions of dollars to Ontario, and that it will soon supplant nearly all other varieties."—*Prof. C. A. Zavitz.*

Mr. James Crawford, representing linen manufacturers in Ireland and Scotland, is visiting Canada to endeavour to encourage a greater production of flax.

Owing to the war, the linen factories in the old land are finding themselves short of flax fibre which has been drawn largely from Belgium, France and Russia.

Mr. Crawford will confer with the provincial and Dominion Government representatives throughout Canada, in many parts of which, more particularly in the West, flax is grown over large areas, but the fibre has been largely allowed to waste. Mr. Crawford is prepared to recommend newer methods of handling the crop than generally prevails on this continent.

The Department of Education of British Columbia has announced a series of summer courses of instruction for teachers. Courses are to be held in the Victoria High School from July 6th to August 1st. The courses will include the following subjects: Rural Science and School Gardens, Manual Training, Manual Arts, Household Arts, Art and Vocal Music. Competent instructors will be in charge of the classes, and in several courses as much outdoor study will be taken as is found practicable and consistent with the programme of studies. The Rural Science Course will include studies in school gardening and studies with respect to plants, birds, insects, soil, farm animals, horticulture and floriculture, field husbandry, weeds, bacteriology, weather, agricultural literature and forestry.

The department of Education of Manitoba issues a monthly bulletin to teachers throughout the province. It is a pamphlet of eight pages and contains official notices, also hints and suggestions for the teacher in the class-room, garden and play-ground. Among other things the December bulletin contains a list of bulletins of the Department of Agriculture at Ottawa, that were considered useful as supplementary reading for the pupils. It also contains a small list of selected bulletins issued by the Agricultural Department at Winnipeg.

The Department of Agriculture of British Columbia will make a distribution of 1 pound each of 3 varieties of corn and 5 pounds of alfalfa seed to members of Farmers' Institutes in that province for the season of 1915. With each allotment of seed instructions are given regarding the sowing of the seed and caring for the growing crop. Those who receive the seed must agree to furnish reports of the results obtained.

The department also is preparing to provide for sale, to members of Farmers' Institutes, selected seed of varieties of corn, mangels, alfalfa and oats, suitable for the province.

The Canadian Pacific Railway Company, through the Department of Natural Resources at Calgary, has in operation a system for assisting farmers to purchase live stock. Dr. J. G. Rutherford, Superintendent of the Agricultural and Animal Industry Branch, has explained the scheme to THE AGRICULTURAL GAZETTE.

He said:—"This department purchases at the lowest possible price, good, sound grade heifers and young cows, which are afterwards sold, practically at cost, to settlers on the lands of the company, on one year's credit, secured by lien note bearing 8 per cent interest.

"The settler holding the cattle reports once a month giving full information regarding each animal, the amount of feed on hand, etc. When the note is due, if the settler cannot pay in full, but conditions are otherwise satisfactory, his credit is extended, it being contrary to the policy of the company to exercise the lien unless such action is absolutely necessary.

"Occasionally deserving settlers, who for one reason or other, are unable to finance themselves, are furnished with horses, but these transactions, together with advances for seed grain, implements, etc., are quite distinct from the live stock operations outlined above. A very considerable number of registered Shorthorn bulls of dairy breeding are being placed in different districts throughout the country. Although preference in this regard is given to districts in which the company has the largest numbers of cattle out under lien, a very considerable number of bulls have been furnished to other districts."

"Up to December 31, after five months only, twenty-three billion dollars was the total of the world financial statement (funds provided and trade losses), not reckoning the destruction of property. In three months the little kingdom of Belgium suffered loss to the extent of over $1,000,000,000. And the end is not yet, for 2,000,000 refugees cared for by Holland, England and France and 5,000,000 within the German lines, are being fed by the United States, Canada and other nations. The latest call is for at least one shipload of food every day. Yes, all the world is in the war. The British Empire is at war, and Canada is just beginning to realize that she also is really at war.

"The farmer who quietly, honestly, determinedly lays his plans for more wheat, more oats, more milk, more beef, more flax, more of almost anything that he knows best how to grow, will be doing only his duty, he will be contributing what he alone can contribute, and he will be helping in the fight, for, as Napoleon said 'An army fights on its stomach.'

"Let us remember that it is more bushels per acre, more pounds of milk per cow, more pounds of meat per animal that will count, and that will mean more total food per farm. Let us in 1915 make good on the farmers' fighting-line with 'More than Usual.'"

C. C. James.

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